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UNITED STATES PATENT APPLICATION

FOR

**METHOD AND APPARATUS FOR AN ADVANCED SPEECH  
RECOGNITION PORTAL FOR A MORTGAGE LOAN  
MANAGEMENT SYSTEM**

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**METHOD AND APPARATUS FOR AN ADVANCED SPEECH  
RECOGNITION PORTAL FOR A MORTGAGE LOAN  
MANAGEMENT SYSTEM**

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**RELATED APPLICATIONS**

This application is a continuation-in-part to non-provisional co-pending application Serial No. 09/645,799 filed August 24, 2000, titled "Method and Apparatus for a Mortgage Loan Management System." This application is filed in accordance with 37 CFR § 1.53 (b)(2) and is also related to the following co-pending non-provisional utility applications:

Serial No. 09/645,775 Filed August 24, 2000, titled "Method and Apparatus for a Mortgage Loan Origination Gateway";

Serial No. 09/645,796 Filed August 24, 2000, titled "Method and Apparatus for Verification of a Qualified Mortgage Loan Originator";

Serial No. 09/645,217 Filed August 24, 200, titled "Method and Apparatus for a Mortgage Loan Originator compliance Engine.";

Serial No. 09/645,800 Filed August 24, 2000, titled "Method and Apparatus for a Mortgage Loan Task Flow Process";

Serial No. 09/645,798 Filed August 24, 2000, titled "Method and Apparatus for a Mortgage Loan Process Interaction Gateway";

Serial No. 09/645,801 Filed August 24, 2000, titled "Method and Apparatus for a Mortgage Loan Transaction Service Provider Gateway"; and

Serial No. \_\_\_\_\_ filed February 13, 2001, titled "An Interface System for a Mortgage Loan Originator Compliance Engine."

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### TECHNICAL FIELD

5           The present invention relates to the general field of computers, telecommunications, and computer and Internet related systems. More specifically the invention relates to automatic speech recognition systems for use in conjunction with systems and processes used in the mortgage industry for moving or tracking a mortgage loan through one or more of the steps of  
10           ‘originate’, ‘approve’, ‘close’, ‘fund’, and ‘ship’, the process and system being driven by a rigorous application of compliance procedures.

### BACKGROUND

15           There is a need for an automated system for managing the processing of mortgage loan applications, wherein the identification of the loan originator and his/her location determine the Federal and State mortgage loan laws and regulations as well as the professional guidelines which govern the loan transaction, and wherein the automated system uses the specific loan regulations to determine the tasks required to complete a loan transaction, including tasks  
20           required by federal and state law, provide the set of required tasks to lenders and other interested parties, monitor the completion of the set of tasks, and if requested by a lender, to use the set of tasks internally to drive the flow of the automated mortgage loan process to completion.

25           Moreover there is a need in the mortgage loan industry to provide mechanisms for third party loan originators to make use of cell phone technology for accessing applicant’s mortgage loan processing and automated compliance system. Although many third party loan originators have access to computers including laptops, it is not always convenient to “boot up” a system and access the internet especially when one is not in a home office situation but rather on the  
30           road with clients. The cell phone has become ubiquitous in the real estate industry. By allowing a third party originator to simply dial a phone number and

perform functions through a voice activated system, applicants have made it easier for these individuals to interrogate, report, and check the status of information associated with the work they are performing in behalf of their clients. The prior art contains over 1600 US patents referring to "speech recognition" in some form or another. This plethora of patents includes US # 4,239,936 issued 10/7/80 to Nippon Electric Co. Ltd. titled "Speech recognition system", US # 5163083, issued 11/10/92 to AT&T Bell Labs titled "Automation of telephone operator assistance calls"; and US # 6,199,043 issued 3/06/2001 to IBM Corp. titled "Conversation management in speech recognition interfaces." However, in these 1600+ patents there appear to be none which teach the use of a speech recognition front end to a mortgage loan management system, and we find no references which suggest the use of such a system with a loan management and compliance system.

As to the compliance system of the present invention, the Federal laws and regulations in question are basically those outlined in the Real Estate Settlement Procedures Act (RESPA) and the Federal Housing and Urban Development's (HUD's) implementing Regulation X. The State regulations in question are those State specific regulations and implementing instructions that serve a similar purpose, relating to Lender payments to Mortgage Brokers and other settlement service providers. RESPA is the federal law implemented by HUD's Regulation X, to protect home buyers from excess costs and confusion when securing a home mortgage loan. Among other federal laws, the Truth in Lending Act ("TILA") and the Equal Credit Opportunity Act ("ECOA") impact the mortgage loan process. Under the TILA, certain credit related disclosures are required to be made to the borrower prior to the consummation of a mortgage loan transaction, so that the borrower understands the total cost of the loan.

The ECOA, and its implementing regulation, Regulation B, were enacted and promulgated to require that lenders make credit equally available to all creditworthy borrowers without regard to race, color, religion, national origin, sex, marital status, age, receipt of public assistance or the fact that the borrower in good faith exercised any right under the Federal Consumer Credit Protection Act.

In addition to the prohibition against discrimination, the ECOA and Regulation B also contain, among others, requirements regarding the provision of appraisal reports, evaluation of applications, spousal signatures, and the provision of adverse action notices.

Regarding state laws, most jurisdictions have enacted licensing statutes that may require real estate sales professionals, builders, financial institutions/lenders and mortgage brokers to obtain a license and satisfy various other financial, educational and operational requirements. Most jurisdictions also have enacted laws that impose, among others, requirements regarding the types of fees that may be charged to a Borrower in connection with a mortgage loan transaction and the persons entitled to receive such fees, as well as certain jurisdiction-specific disclosures that must be provided to the Borrower.

There is a need for a system to facilitate the application of all of these laws and regulations ("regulations") in an efficient and systematic manner during the course of a mortgage loan transaction by using the telecommunications and computing facilities available to the market today.

While some state laws are more restrictive, RESPA allows a licensed real estate professional to receive compensation for originating a mortgage loan only if that real estate professional provides goods or facilities or performs services that are necessary for the origination of the loan and that are separate and distinct from any services the real estate professional provides incident to the sale of the property that secures the mortgage loan. Moreover the mortgage loan process is labor intensive, error prone and time consuming for all parties concerned, making it difficult for a real estate professional to track the services he or she provided to satisfy RESPA and state requirements to justify receiving compensation. Automating the interface between the various users of an automated loan processing system and the system itself provides a useful, concrete and tangible efficiency in the process.

As indicated above, increasing oversight on the part of governments and regulatory agencies have required increased levels of sophistication in the traditional borrower-lender relationship. While these oversight demands are

generally considered to be a benefit to the borrower-lender relationship, it is, nonetheless a burden to all parties, and significant increases in both time and cost are accrued to the process. Additionally, protective regulations added by the lending community under whose umbrella the industry operates, further protract the process of 'doing business'. As indicated above, these regulations and 'rules' governing the mortgage process permit those in the loan origination role to receive a fee for services rendered when the applicable rules are followed, as well as penalties and loss of fees for non-compliance. For example, RESPA has criminal penalties wherein a violator can go to jail for up to a year. There is a great need therefore, for a loan mortgage compliance system which makes it efficient and convenient for a Real Estate Sales Professional to move and track a mortgage loan through the loan process.

The impacts from this increased burden are manifold. The process of obtaining a property-secured loan is protracted by regulation and disjointed, because the participating agents, workers, institutions, and individuals are linked throughout the transaction by archaic means, that is to say, via face-to-face meeting, telephone conversation, fax, postal mail, private delivery contractors, e-mail, and electronic file transmittal. While in some instances, these means are considered by some to be state-of-the-art, they are not. Inherent in all of these transactive mechanisms is the human element. It is typical that time is consumed from the loan application, underwriting, and issuance process because a person is involved at virtually every step of the process. Typically, individuals process information serially, that is, one requirement after another, whereas other means exist to process information and service requests in parallel, where multiple requests are handled or processed simultaneously.

In present implementations, the mortgage underwriting process generally follows the following pattern: A borrower, wishing to purchase or improve real property, and usually without the help of experienced advisors, makes a personal determination of the amount of available money generally required for a down payment and his or her ability to repay a loan for the balance. With this personal estimate in mind, a borrower (or buyer) begins a search for property and attends

carefully to the costs of said property, making sure that the scope of the search is within the individual's envisioned cash flow constraints and acceptable debt ratios. Generally, individuals seek the professional services of a skilled Real estate sales professional or other agent to aid in the search for suitable property.

Concurrent with this search, the individual will often, at the advice of a Real estate sales professional, seek to obtain a pre-approval for an envisioned loan amount, or at least a pre-qualification for a loan. In certain lending models envisioned by the present invention, loan approvals are accompanied with a 'rate-lock', or an indication by the lending institution of the available interest rate. Until such a commitment is obtained, it is generally not possible for the individual to faithfully commit to the purchase of property. In the current practice, the pre-approval process occurs outside of the Real estate sales professional's control. However, when a loan pre-approval is obtained, the buyer may, in good faith, negotiate with a seller for the purchase of property. Such negotiations are almost always facilitated by the attending Real Estate Sales Professional(s) who represent the buyer and/or seller in the negotiation. When a mutually agreeable price is determined, and terms of the agreement specific to the buyer and seller are negotiated, appropriate documents are signed, such documents constituting a formally offered and accepted 'offer to purchase'. At this time, the lending institution originally issuing the loan pre-approval is contacted to proceed with the loan application. It is at this step that the aforementioned 'burdens' come to bear on the transaction. Accordingly, there is a need to provide cost efficient and effective means for the Real Estate Sales Professional to input data into the process and to query status of the loan.

In the past, attempts have been made to automate some parts of this process. For example, U.S. Patent No. 5,995,947 issued 11/30/99 to IMX Mortgage Exchange titled "Interactive Mortgage and loan information and real-time trading system" provides a system and method for trading loans wherein a transaction server maintains a database of pending loan applications and their statuses, and wherein each party to the loan (broker, lender) can search and modify the database consistent with their role in the transaction. However this

system focuses on only one facet of the loan process itself. Other parts of the loan process are addressed in U. S. Patent No. 5,966,700 issued 10/12/99 to Federal Home Loan Bank of Chicago, titled "Management System for Risk Sharing of Mortgage Pools" is a system wherein a mortgage originator (bank, savings & loan, etc.) and a funding institution (Federal Home Loan Bank, etc.) agree to assume certain risks for the mortgage by entering into a credit agreement having an overall credit enhancement value, and wherein the system calculates and records the allocation of mortgage interest and credit risk between them. This system functions after a mortgage has been issued which is outside of applicants' present system. Another recently issued patent related to mortgage loans is U. S. Patent 5,991,745 issued 11/23/99 to Fannie Mae, titled "Reverse Mortgage Loan Calculation System and Process", which is a payment calculation system related to loans that the borrower is generally not required to repay until the security property is sold. Still another is U. S. Patent No. 5,940,812 issued 8/17/99 to LoanMarket Resources, LLC titled "Apparatus & Method for Automatically Matching a Best Available Loan to a Potential Borrower via Global Telecommunications Network" teaches a system for matching loan requests (and related credit data) to lenders (with related eligibility criteria) in order to facilitate such loans whether they be for automobile purchases or whatever. Similarly, other U. S. Patents teach methods for real time loan approval (No. 5,870,721), methods for Lender direct credit evaluation and loan processing (Nos. 6,029,149; 5,930,776; and 5,611,052); and methods for keeping track of loans, loan histories, leases and pertinent data related thereto (No: 4,774,664).

Inherent in most property transactions, especially those involving a mortgage, are other elements which, as suggested before, serve to protect the interests of all concerned parties, but which unnecessarily protract the underwriting process. These generally include at least the following: a processing procedure and fee to originate the loan application, a title search to discover any encumbrances on the property such as liens, overdue taxes, etc., a credit check on the borrower of record to determine the credit-worthiness of the individual, a verification of employment which speaks to the individual's ability to repay the



loan, a property survey, where such is dictated by local laws, an appraisal to determine if the property value secures the lender's investment, application for various insurances such as flood, earthquake, or other insurance as local law and custom requires, the loan application itself, and other such applications, searches, and discoveries, as local laws dictate. In addition to the aforementioned, an income to debt ratio is established to help select the most appropriate loan program(s) consistent with the lender's policy and the borrower's requirements.

Of equal importance in the process is the distribution of service fees and commissions associated with real estate mortgage transactions. The timeliness and accuracy of transactions can adversely affect the payment of various agents or workers involved in the process. Furthermore, because of the almost casual connection between the parties to the transaction, coupled with heretofore rigid definitions of each worker's responsibility, creative solutions to the aforementioned problems were not forthcoming, and little could be done to remedy these problems. Personal intervention on the part of agents or other workers could help, but weren't part of the scope of the transaction, were unreliable, and were differentially applied, often in consideration of such elements as the wealth or prestige of the borrower, the value of the property, personal friendships, or other less tangible factors.

Many of the agents or workers participating in the transaction bear a limited portion of the responsibility for the transaction. Employment verification, title searches, and the like, are often of fixed duration and required effort with mortgages falling within a broad value range. As such, these workers enjoy a steady, regulated income flow. It falls however, to the real estate agent to invest time on an open-ended basis to accomplish a sale. In this instance, the commission is often fixed by industry convention or statute, and the Real estate sales professional typically doesn't enjoy the benefit of serving as both listing and buying agent, which might net a full commission. More typically, the agent must make a 50/50 split with another agent or agency. Adding injury to this significant commission reduction is the typical requirement that the remaining commission balance be split, usually 60/40, with the Real estate sales professional's parent

agency. It is common for a Real estate sales professional, having invested many hours over a period or weeks or months, to realize a modest 1-2% of the selling price of the property. Given this scenario, it is expected that a Real estate sales professional will focus on opportunities which will bear fruit faster, and leave the longer-term prospects alone, even though they have a similar reward and are of equal value in the eyes of the respective buyers and sellers. The Real Estate Sales Professional is therefore eager to efficiently process and track the steps of the individual loan transactions.

The current state of the art simply does not provide a means whereby the real estate sales professional, or any other agent or worker, may participate in the other portions of the monetary flow, beyond that which is historically common to their respective industries. Moreover, current systems do not provide mechanisms for users to interface to a loan management and compliance system by use of their cell phones instead of a Personal Computer (PC).

While there are a number of developing systems, as mentioned above, for automated lender selection and loan tracking, it is clear that a need exists for an automated system based upon a database of federal, state and local rules and regulations, which can be used to identify, for a given loan transaction, the set of tasks required to process and complete the loan transaction, including tasks required by applicable federal and state law, and to track the set of tasks during the process itself to reasonably assure that completion of tasks within these rules and regulations can be reported, or alternatively, that task completion may be traced to the completing entity. Moreover there is a need for the use of an automatic speech recognition system in conjunction with such a mortgage loan and compliance system to facilitate the system inputs and provide efficient, useful and concrete tracking status data to the Real Estate Sales Professional.

### SUMMARY OF THE INVENTION

The present invention provides a solution to the needs described above through a system and method for managing and tracking the mortgage loan process, whereby users may interface with the system by means of a cell phone.

5 The automated system of the present invention uses the Federal, State, local and professional regulations and requirements and implementing instructions to generate a plurality of tasks which can be used to control and drive the process of handling a mortgage loan application to completion and settlement in accordance with these regulations . Loan requestors may specify that the system will generate

10 the plurality of required tasks, including tasks required by applicable federal and state law, provide the plurality of required tasks to the requestor for his execution, and monitor the completion of all required tasks so as to generate a completion certificate to the requestor. Alternatively, loan requestors may specify that the automated system will generate the plurality of required tasks, including tasks

15 required by applicable federal and state law, will manage and control the execution of the required tasks, and monitor the completion of all required tasks so as to provide a completion certificate to the requestor.

A computer implemented method is disclosed for processing a loan application wherein the system receives a request to process a loan, the request

20 being by voice input; wherein the system generates a plurality of tasks, the tasks comprising actions required to process the loan, including tasks required by applicable federal and state law; and distributes one or more of the required tasks to one or more persons capable of performing one or more of the tasks.

An apparatus is disclosed for automated processing of loans which has a

25 computer system with communications devices for receiving a request to process a loan; the computer system having logic devices programmed to generate a plurality of tasks required to process the loan, wherein the tasks are made up of actions which are required for a specific loan by various legal rules and regulations; and wherein the computer system has logic devices programmed to

30 distribute the plurality of tasks to various persons who can carry out the tasks or monitor completion of the tasks, and the apparatus further comprising a voice

portal device coupled to the computer system whereby voice messages from users are received, translated into digital form and transferred to the computer system logic devices for further processing.

Also disclosed is a server node in a network which is responsive to a request to process a loan by generating a plurality of tasks which are required to process the requested loan and for distributing the plurality of tasks to persons who are qualified to perform the tasks or need to monitor the tasks and the server node also having a voice portal device coupled to the server node whereby voice messages from users are received, translated into digital form and transferred to the server node mechanisms for further processing. Also disclosed are mechanisms in the server node for monitoring the completion of the plurality of tasks related to a given loan and for generating reports and completion certificates associated with the actions related to the given loan.

Also, a computer program stored on a computer readable medium or carrier wave is disclosed having computer code mechanisms for receiving a loan request by voice input; for translating the voice input into a digital form and passing the request to other program mechanisms for further processing; for generating a plurality of tasks required to process the loan and distributing the plurality of tasks to persons capable of performing those tasks or need to monitor the tasks. Additional code mechanisms are disclosed which monitor the completion of the plurality of tasks and when all tasks are completed can issue various reports and completion certificates.

Still other embodiments of the present invention will become apparent to those skilled in the art from the following detailed description, wherein is shown and described only the embodiments of the invention by way of illustration of the best modes contemplated for carrying out the invention. As will be realized, the invention is capable of modification in various obvious aspects, all without departing from the spirit and scope of the present invention. Accordingly, the drawings and detailed description are to be regarded as illustrative in nature and not restrictive.

## DESCRIPTION OF THE DRAWINGS

The features and advantages of the system and method of the present invention will be apparent from the following description in which:

Figure 1 illustrates a typical configuration of Internet connected systems representative of the preferred embodiment of the present invention.

Figure 2 illustrates a typical general purpose computer system of the type representative of the preferred embodiment.

Figure 3 illustrates the business model which encompasses the present invention.

Figures 4A & 4B illustrate a functional flow chart of a preferred embodiment of the system.

Figure 4C illustrates a configuration of an embodiment of the system which contains the invention.

Figure 4D illustrates exemplary functions of the Compliance Engine.

Figure 5 illustrates a configuration of an alternative embodiment of the system which contains the invention.

Figure 6 is a flow chart depicting the process Map and Workflow Definition for a New Loan.

Figures 7 - 30 illustrate exemplary screenshots for the system embodying the present invention .

Figure 31 illustrates an exemplary Internet configuration showing the hardware and software systems used in an embodiment at this time.

Figure 32 illustrates another exemplary Internet configuration showing the hardware and software systems used in an embodiment at this time.

Figure 33 illustrates an exemplary embodiment of the Input gateway module.

Figure 34 illustrates an exemplary relationship of various system elements with the GHR sub-system.

Figure 35 illustrates an exemplary embodiment of the “task maintenance & status reporting” gateway.

Figure 36 illustrates a preferred embodiment of the “transaction service provider” gateway.

5        Figures 37 - 41 depict additional screen shots of the system embodying the invention, showing an exemplary set of tasks required to complete a loan.

Figure 42 depicts an exemplary speech recognition system as used with the present invention.

FIG. 35

## DETAILED DESCRIPTION

The present invention provides a solution to the needs described above through a system and method for managing and tracking the mortgage loan process, whereby users may interface with the system by means of a cell phone or standard telephone. The automated system of the present invention uses voice recognition processes to convert voice input into digital form for further processing by other parts of the system. The automated system of the present invention uses the Federal, State, local and professional regulations and requirements and implementing instructions to identify the set of tasks required to process a specific loan application, including tasks required by applicable federal and state law, to use, or provide this set of tasks to a lender to use, to drive the process of handling the specific mortgage loan application, and to monitor and report the completion of the specified tasks as required by these regulations, or alternatively, that the required task completion may be traced to the completing entity.

The heart of various embodiments of the present invention is a module designated an Automated Compliance Engine (the "Compliance Engine") which is designed to maintain and use a rules-based loan compliance database to generate the set of tasks required to be performed to complete and close a specific mortgage loan transaction. This Compliance Engine is described in more detail below. However, we now describe a general overview of a preferred embodiment of the invention.

### **(1) General Overview**

Mortgage loans may be originated through the applicants (OnePipeline.com) website, or through other lender's websites to originate loans that will interface with the compliance engine. The technology used as part of the system currently is, able to interface with many other industry standard software programs to make the exchange and flow of data easy and accurate.

The system is predominantly web-enabled, which extends its use to all industry professionals connected to the Internet. The system contains the Compliance Engine that applies Federal, State, Local, and profession based filters to each loan application and each Loan Originator to create a combined task list that defines a custom workflow process for every transaction originated through the System and Program, which forms the basis for monitoring the steps and procedures required for a specific loan transaction in order to provide a completion report for the specific mortgage loan. The rules applied to each new mortgage loan application will determine who is permitted or required to perform which services in the loan origination process under the Program and who will receive fair market compensation for services actually performed. The System then creates a record of the actual workflow. The list, as a composite of compensation or origination tasks and required tasks, is represented as a 'task list', and may optionally be presented to a subscriber client through an API.

## **(2) Detailed Description**

In an embodiment of the System, the Borrower and Loan Originator work together throughout the loan origination process. Once a Borrower decides to work with a Loan Originator on the System, the System will have the Borrower and Loan Originator answer typical financial and property questions concerning the Borrower. The answers to these questions will allow the System to pre-qualify the Borrower for a loan and offer appropriate loan program options to the Borrower. Once the System makes this information available to the Borrower and Loan Originator, the Borrower will be able to choose to make a formal mortgage loan application on-line through the Loan Originator.

After a consultation between the Borrower and Loan Originator, the Borrower will then be able to select a loan program -or request the System to find the most advantageous interest rate available from the various lender options. The System and staff will select a loan product and submit the application to the



appropriate lender for approval and distribute on-line results back to the Borrower and Loan Originator, together with a complete set of underwriting conditions.

An exemplary sequence of events is as follows:

5       The Loan Originator consults with the borrower about the property and loan products generally available,

      After entering the required data, including a self-declared credit profile, the application is programmatically compared to available products, typically using a service and program of the type provided by GHR's PremierPricer™ software,

10       If a list of suitable products is returned by a GHR-like system, the Loan Originator assists the Borrower in selecting the preferred loan product,

      The Application is then re-submitted to the GHR-like product selection system and the credit rating of the Borrower is programmatically obtained,

15       With the 'official' credit rating available, the GHR-like system returns a list of one or more loan products,

      If the desired loan product is on the list, then the application process proceeds to underwriting,

20       If the desired product is not available, but there are other loan products, then the Loan Originator and the Borrower will select and apply for another suitable loan product,

      If no loan products are available, then the system returns an appropriate notification, and the loan application is forwarded to the lender, with the initial desired loan product, for human review, adjustment, and probable selection of a suitable loan product for underwriting.

25       Making either selection will notify the System of the Borrower's intent to proceed with the mortgage loan origination process and will initiate the rules evaluation process, coincident with underwriting of the loan, as described in the next paragraph.

30       The System's Compliance Engine will apply a set of rules appropriate to each mortgage loan transaction, including property and borrower profile, originator's professional guidelines, state and federal regulations and other

relevant rules. The final filtered task list will then apply to each mortgage loan transaction in an attempt to assure that the mortgage loan is originated in accordance with applicable federal and state laws. This will include, making sure that qualified Loan Originators, Independent Contractors and Local Loan Processors are permitted to perform services associated with the loan origination process and that all services required to be performed in order for the Loan Originator, Independent Contractor and/or Local Loan Processor to receive compensation in connection with the mortgage loan transaction are actually performed.

Based on the mortgage loan origination process requirements defined by the Compliance Engine, the Loan Originator will make decisions about each of the service providers (e.g., inspection companies, surveyors, appraisers, title companies, etc.) the Loan Originator wishes to have involved in the mortgage loan transaction. Any qualified service provider will be able to be selected by the Loan Originator and entered into the System at this point. Some nationwide service providers may, in the future, have a direct online ordering system available inside the System. Others may still require the typing in of the name and contact information. OnePipeline.com, Inc. expects that it will be most common for Borrowers to select local service providers with whom they are familiar.

After the Borrower selects the service providers, the Loan Processor will confirm to the system which services have been provided by the Loan Originator. As described in more detail below, the services actually performed by the Loan Originator, Independent Contractor and/or Local Loan Processors will serve as the basis for the fees earned as fair market compensation for performing settlement services in connection with the mortgage loan origination process under the Program.

After each of the above steps are completed, the System will automatically create a workflow process based on the applicable rules and appropriate tasks will be eventually assigned to each of the service providers for the mortgage loan transaction. In a preferred embodiment, the mortgage loan data and applicable tasks will be passed to a workflow generation system, either implemented as an

integral part of the system of the invention, or as a service provided by a remote application service provider (ASP), which will generate an automated workflow process which can notify each service provider of his task(s) and allowing each service provider to interact in completing needed tasks. All task assignments will be distributed by the System and tracked. At this point, many people will be working on the loan simultaneously though the System. For example, the Loan Originator may be obtaining financial information from the Borrower, the Independent Contractor may be ordering an appraisal, the Local Loan Processor may be verifying Borrower information, and various service providers may be performing services and adding information to the mortgage loan file through the System. Hard copy data will be input by either OnePipeline's staff, an Independent Contractor (to the extent permitted under state law) or the Local Loan Processor, and added to the physical mortgage loan file. Work notices and status communications may be generated automatically by the System to keep the process moving and to ensure that all appropriate parties perform their assigned tasks in the proper order to meet all rules requirements applicable to the mortgage loan transaction.

### **c. Products Available**

Borrowers may obtain a loan using the facilities of the lender organization, in which mode the system of the invention merely determines which tasks are required and tracks the completion of the required tasks. By obtaining a loan through the Program, Borrowers will be given access to a wide variety of first lien, fixed and variable rate, closed-end mortgage products (both purchase money and refinancings) at competitive rates and pricing, and in a timely and efficient manner. For example, as noted above, OnePipeline.com, Inc. will make available to the Borrower, loan products and interest rates that are available from its participating lenders. OnePipeline's System and Program also will make available and support secondary lien, fixed and variable rate, closed-end loan products and interest rates available from its participating lenders. In the future, OnePipeline may give Borrowers access to first and second lien, fixed and variable rate, open-

end mortgage products through the Program. OnePipeline's Program and System will not make available or support mortgage loans that constitute "High Cost" or Section 32 mortgage loans, which are covered by Section 32 of Regulation Z, 12 C.F.R § 226.3

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#### **d. Funding Source**

In a preferred embodiment, OnePipeline.com, Inc. will not fund any mortgage loans, and no mortgage loans will be closed in OnePipeline's name. OnePipeline will be acting exclusively in the capacity as mortgage broker. All mortgage loans will be funded by, and closed in the name of, a participating lender. In an alternative embodiment, OnePipeline could fund certain mortgage loans and close loans in their name in those jurisdictions where qualified to do so.

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#### **e. Disclosures and Form Documents**

In a preferred embodiment, the System will produce applicable Borrower disclosures (on a state specific basis) required under applicable law to be provided to the Borrower in connection with the mortgage loan origination process under the Program. The Loan Originator will be required to provide the disclosures to Borrowers at the appropriate times. Moreover, the Loan Originators will be required to provide the Borrower with a disclosure that informs the Borrower that the Loan Originator will receive compensation for services actually performed by the Loan Originator in connection with the mortgage loan transaction. This disclosure also will inform the Borrower that the Loan Originator is an exclusive part-time W-2 employee of OnePipeline, and that the Borrower is free to use another mortgage broker or lender other than OnePipeline.

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The System also will allow a lender to elect to use a standard set of mortgage loan documents, which can be printed off of the System, in connection with a mortgage loan originated through OnePipeline's Program, or the Lender may use its own forms. The forms available off of the System will be provided to OnePipeline by a third-party document vendor.

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#### **f. Mortgage Loan Fees**

Fees will generally include, among other permissible fees: (1) origination fee payable to the lender and passed through to the Loan Originator based on services performed; (2) underwriting fee payable to the lender and passed through to Local Loan Processor; (3) impound waiver fee payable to the lender and passed through to secondary market investor (only on loans without escrow accounts); (4) processing fee payable to the lender and passed through to Local Loan Processor; (5) document preparation fee payable to the lender and passed through to third-party vendor; (6) tax related service fee payable to the lender and passed through to third-party vendor; and (7) attorney fee payable to lender and passed through to closing attorney. OnePipeline.com, Inc. will charge a lender a membership fee to participate in OnePipeline's Program and a flat fee for each Completion Certificate issued to the lender.

#### **g. Loan Originators**

In a preferred embodiment, mortgage loans will be originated through the System and Program by licensed real estate sales professionals, such as real estate agents/salespersons and, in limited cases, real estate brokers. The individual real estate agents and individual real estate brokers (i.e., brokers that are not corporations or similar business entities) will enter into an employment agreement with OnePipeline, and become part-time W-2 employees of OnePipeline.com. The employment agreements will expressly require the Loan Originator to originate mortgage loans exclusively for OnePipeline.com, and prohibit the Loan Originators from receiving compensation for performing loan origination services for another mortgage lender or mortgage broker.

In the future, other non-traditional originators, such as investment advisors, financial advisors, accountants and other professionals may be added to the Program as Loan Originators, in each case to the extent permitted by applicable law. Loan Originators may also have an affiliation with a mortgage lender, which defines the selection of loan products the Loan Originator may offer.

**i. Local Loan Processors**

In a preferred embodiment, wherein the loan is being processed through the system of the invention, loan processing functions which would trigger mortgage broker or similar licensing requirements under applicable state law will be delegated to properly licensed Local Loan Processors who will receive compensation intended to be fair compensation for services actually rendered by them. The Local Loan Processors will be either mortgage brokers and mortgage bankers.

**j. Services Performed**

As noted above, in a preferred embodiment, a Loan Originator will initiate the mortgage loan process with a borrower using OnePipeline's System. The services that a Loan Originator will have to perform, in all cases, in order to be fully compensated include the following: (1) obtaining the applicant's signature on disclosures, (2) obtaining the applicant's signature on the credit authorization, (3) pre-qualifying applicants, (4) assisting applicants in selecting loan products, (5) taking the loan application or obtaining loan application information, (6) reviewing the credit decision with the applicant, (7) explaining the good faith estimate and other disclosures to the applicant, (8) collecting documentation from the applicant that is needed in connection with processing and underwriting the loans, (9) updating the applicant and responding to applicant inquiries, (10) locking the interest rate, and (11) scheduling and attending the closing.

If a Loan Originator does not perform all required services, the services will be performed by OnePipeline's staff, Lender's staff, an Independent Contractor (to the extent permitted under applicable state law) or by a Local Loan Processor, and the compensation received by the Loan Originator will be reduced accordingly.

By way of additional background, the basic of the rules and regulations which form the heart of the present invention are now described in more detail.

### RESPA Compliance

The following is a brief summary of RESPA and its implementing regulation, Regulation X, and their requirements. It is not intended to be comprehensive. For example, RESPA and Regulation X may not apply in all situations, and their application is not discussed below. Users should consult RESPA, Regulation X and independent legal counsel for complete explanation of RESPA, Regulation X and their requirements.

The Real Estate Settlement Procedures Act ("RESPA") is a federal statute that was enacted by Congress in 1974. A federal regulation implementing RESPA ("Regulation X") also has been promulgated by the United States Department of Housing and Urban Development ("HUD"). HUD is the federal agency charged with administering and enforcing RESPA, Regulation X and their requirements.

RESPA was enacted to provide Borrowers with greater and more timely information on the nature and costs of the home buying/settlement process, and to protect Borrowers from unnecessarily high settlement charges caused by certain practices believed to be abusive. Among other requirements, RESPA and Regulation X prohibit the payment or receipt of "any fee, kickback or thing of value" (i.e., a referral fee) in exchange for the referral of settlement service business. Settlement service business includes, among other services, loan origination services such as taking applications, obtaining income verifications and communicating with a borrower or lender.

RESPA and Regulation X permit a lender to make reasonable payments to its agents and contractors for services actually performed in the origination, processing or funding of a loan. Based on interpretations of this provision in RESPA and Regulation X, real estate sales professionals and others may, in certain circumstances, provide loan origination services and receive fair market compensation for the services they actually perform.

The preferred embodiment of the invention in OnePipeline.com's program and system are designed around this provision. Applicant's loan originators are required to perform certain settlement services in connection with loans originated by OnePipeline.com, and the compensation received by these loan originators and

regional loan processors is intended to be fair market compensation for the services they actually perform.

Other Federal and State Compliance

The following is a brief summary of other federal and state statutes, regulations and laws that impact OnePipeline.com's system and program, and a user's performance of services under this system and program. It is not intended to be comprehensive. Users should consult the statutes, regulations and laws, and independent legal counsel, for a complete explanation of other applicable federal and state statutes, regulations and laws.

Among other federal laws, the Truth in Lending Act ("TILA") and the Equal Credit Opportunity Act ("ECOA") impact OnePipeline.com's program and system, and the user's performance of services under applicant's system and program. The TILA, and its implementing regulation, Regulation Z, were enacted and promulgated to assure meaningful disclosure of credit terms so that the Borrower will be able to compare more readily the various terms available to the Borrower. Under the TILA, certain disclosures are required to be made to the Borrower prior to the consummation of a mortgage loan transaction.

The ECOA, and its implementing regulation, Regulation B, were enacted and promulgated to require that lenders engaged in the extension of credit make that credit equally available to all creditworthy Borrowers without regard to race, color, religion, national origin, sex, marital status, age, receipt of public assistance or the fact that the Borrower in good faith exercised any right under the Federal Consumer Credit Protection Act. In addition to the prohibition against discrimination, the ECOA and Regulation B also contain, among others, requirements regarding the provision of appraisal reports, evaluation of applications, spousal signatures, and the provision of adverse action notices.

Regarding state laws, most jurisdictions have enacted licensing statutes that may require real estate sales professionals, builders, financial institutions/lenders and mortgage brokers to obtain a license and satisfy various other financial, educational and operational requirements. Most jurisdictions also have enacted laws that impose, among others, requirements regarding the types of



fees that may be charged to a Borrower in connection with a mortgage loan transaction and the persons entitled to receive such fees, as well as certain jurisdiction-specific disclosures that must be provided to the Borrower.

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### OPERATING ENVIRONMENT

The environment in which the present invention is used encompasses the use of general purpose computers as client or input machines for use by loan originators, lenders and other parties interested in the mortgage loan process.

Such client or input machines may be coupled to the Internet (sometimes referred to as the "Web") through telecommunications channels which may include wireless devices and systems as well.

Some of the elements of a typical Internet network configuration are shown in **Figure 1**, wherein a number of client machines 105 possibly in a branch office of an Real Estate Service, or financial institution, lender, etc., are shown connected to a Gateway/hub/tunnel-server/etc. 106 which is itself connected to the internet 107 via some internet service provider (ISP) connection 108. Also shown are other possible clients 101, 103 possibly used by other loan originators, or interested parties, similarly connected to the internet 107 via an ISP connection 104, with these units communicating to possibly a home office via an ISP connection 109 to a gateway/tunnel-server 110 which is connected 111 to various enterprise application servers 112, 113, 114 which could be connected through another hub/router 115 to various local clients 116, 117, 118. Any of these servers 112, 113, 114 could function as a server of the present invention, as more fully described below. Any user situated at any of these client machines would normally have to be an authorized user of the system as described more fully below.

An embodiment of the Mortgage Loan Management System of the present invention can operate on a general purpose computer unit which typically includes generally the elements shown in **Figure 2**. The general purpose system 201 includes a motherboard 203 having thereon an input/output ("I/O") section 205, one or more central processing units ("CPU") 207, and a memory section 209 which may or may not have a flash memory card 211 related to it. The I/O section 205 is connected to a keyboard 226, other similar general purpose computer units 225, 215, a disk storage unit 223 and a CD-ROM drive unit 217. The CD-ROM drive unit 217 can read a CD-ROM medium 219 which typically

contains programs 221 and other data. Logic circuits or other components of these programmed computers will perform series of specifically identified operations dictated by computer programs as described more fully below.

## DETAILED DESCRIPTION OF THE INVENTION

In consideration of its major aspects, the present invention is a system and methodology, comprising a 'container' concept, wherein the mechanics of real estate transactions beginning with loan origination and proceeding serially and in some instances in parallel through the closing, funding and disbursement and reporting of funds may be accomplished. The system also controls the timing of the process and the time allocated to the completion of each loan occurrence. When the time allocated to a process expires, the task is transferred as required by the rule base. The system, constituting the present invention, is designed to programmatically manage and document all attendant processes with compliance to applicable regulatory rule sets and requirements of participating workers. In a preferred embodiment, data exists within the executing programs as 'objects', the meaning of which as commonly understood by those skilled in the art of 'object-oriented programming'. In a preferred embodiment, the software programs comprising a portion of the present invention are also object-oriented. An integrated relational database management system is utilized to maintain persistent data and to permit and facilitate queries and reports against the persistent data. While the embodiment of the present invention embraces certain elements of a 'closed loop', or self-contained decision-making process, its strength lies in the ability to orchestrate the workers or agents participating in the lending transaction with respect to responsibilities and financial compensation.

The system of the invention encompasses a means whereby the object-oriented 'instances' or discrete occurrences of data, may be stored and retrieved from the relational database management system. In the preferred embodiment, such storage and retrieval is accompanied by programmatic conversion of said data instances to 'formats', or preferred representations upon which the required program(s) may act. Such data storage occurrences and the accompanying

manipulations of said data follow preferred programmatic documentation procedures such as sequentially 'nested' descriptors. An example of a sequentially 'nested' descriptor would be, 'borrower.occupation', where the nested descriptors are separated by a '.' or 'dot', and in such manner are understood to mean, 'the identified borrower's occupation'. Such 'dot' notation will hereafter be used to describe the higher level of programmatic functionality when such explanation is necessary. Those skilled in the art will understand JAVA™ programming, Object oriented Programming, and the use of automated "Agents" to perform programmed tasks whenever activated to do so, HTTP, XML and other communications protocols as described in more detail below.

An exemplary way to articulate the concept and embodiment of the present invention is the idea of a 'container', which brings together the loan originator, the subject real property attributes, and the lender, as well as means to validate transaction profitability and bundle said transactions for sale to lenders. Or in an alternative view, as a means for generating the required compliance tasks for a specific loan transaction, provide the tasks to a lender and monitor the completion of all required tasks by the lender's service providers. The present invention provides decision points wherein the loan originator makes selections from menu(s) generated by the compliance engine acting upon the original information supplied by the originator. The selection process introduces the refined data into an integrated 'workflow' process wherein rule-based engines and other workers or agents act toward a common goal of closing, funding, shipping, and collecting transaction fees on a loan.

Referring to **Fig. 3** there is illustrated, in schematic form, a preferred embodiment of the present invention. The business model is comprised of several functional elements, including at the highest level, embodiments which effect loan origination **301**, closing, processing **303**, funding **305**, and shipping **307**, with transfer of funds. In concert, these elements may be referred to as the 'pipeline' or system which embodies the whole of the several elements comprising the present invention.

As indicated above, the present invention is a method and apparatus for automating the process of generating a set of tasks required for controlling, and regulating a mortgage loan application, underwriting the loan, and tracking the tasks through the closing process, wherein the tasks comply with all known Federal, State and local requirements for the specific loan. Elements of an alternative embodiment include loan origination, authenticating the loan originator, underwriting the loan, closing, processing, funding, and shipping, with transfer of funds, within the regulatory legal framework of funding and reporting, required for these processes. In a preferred embodiment, which is described in detail below, some or most of these functions may be performed by the lender or application service providers (ASPs) with the system of the invention providing the set of required tasks generated by a Compliance Engine and simply monitoring the completion of those tasks.

Referring now to **Figures 4A, 4B, 4C and 4D**, the principal elements of a preferred embodiment of the present invention are illustrated in more functional detail. Original inputs from a lender/loan originator come into the system **401** through the 'Loan Origination Gateway' (**451 in Fig. 4C**) or portal, which serves as an 'entry point' or gateway to the 'pipeline' or system for loan originator data and borrower data. The loan originator data **403** is used as input data to an authentication module (**453 in Fig. 4C**) to verify the lender/loan originator's ID and password. Those skilled in these arts will recognize that this authentication process for the client/user may include digital signature authentication as well as other types of cryptographic verification and authentication of users. If the lender/loan originator's ID and or password do not authenticate, a message is sent back to the originator indicating that fact and the system exits. If the loan originator is found to be qualified, the loan originator data and borrower data are passed to the Compliance Engine **405 (476 in Fig. 4D)** for later use. The borrower-supplied credit data is then passed to a Loan Origination & Program Matching module **407 (456 in Fig. 4C)**. The Loan Origination & Program Matching module returns a list of loan products for which the borrower is qualified **409**. In a preferred embodiment, this function is provided by a

PremierPricer™ program supplied by GHR Systems™ Inc. The PremierPricer™ Component is described in more detail at the GHR Systems web site, which can be found at [www.ghrsystems.com](http://www.ghrsystems.com), which description is hereby incorporated fully herein by reference. Additional detail on the interface to this PremierPricer™ Component is provided below. In an alternative embodiment, the Loan Origination & Program Matching module is one which is supplied by applicants as an integral part of the pipeline system, wherein up-to-the-minute product and pricing information is provided when the module is supplied with basic transaction parameters (i.e., LTV, loan amount, property location, property type, etc.).

Continuing with reference to **Figure 4A**, borrower then selects a loan from the list of loan products for which the borrower is qualified and submits a loan application **411**. In a preferred embodiment, the system, recognizing the loan application selection, submits a credit report request to a credit bureau **413** and passes this data to the GHR Systems PremierPricer™ Component **413**. A list of loan products for which the borrower is qualified are returned to the lender & borrower **415**. If the borrower is not qualified for any loans, **419** the loan request is referred to a loan officer and the system exits **429**. If the borrower is qualified, he selects one of the listed loans (his original selection may or may not be on this list) **421, 423**. Referring now to **Figure 4B** the lender uses this data to process the loan and inputs loan approval data to the system **431**.

The loan data is passed to the Compliance Engine **431** (**477** in **Fig. 4D**). As part of this set of input data the user/lender selects optional tasks for this loan and inputs his selections along with data indicative of his fee arrangement with the borrower **432**. Referring now to **Figure 4D**, this data is passed by the system to the Compliance Engine **479** and the Compliance Engine uses these data (the loan data **477** and the user task selections **479**) to generate a required set of tasks for this specific loan (**433** in **Fig. 4B**). This required set of tasks is generated **478** by selecting the tasks from the task file **480** which are specifically required by the particular loan (i.e. loan type, location, value, etc.) and the contexts **481** (i.e. the combinations of circumstances where the tasks apply). The resultant set of tasks

for the specific loan **483** is separately recorded **482** in a file which can be modified as new tasks may be added or deleted, and as task completions are identified **485**.

In a preferred embodiment, the system can supply this required task list in its entirety to the lender if the lender wishes to manage the task completions himself through his own automated systems (see **441, 443** in **Fig. 4B**). In this case, the system would merely monitor task completion data **445** (see also **485, 486, 487 and 488** in **Fig. 4D**) and if required, issue a Completion Certificate **447** when the tasks are completed and the loan process closed. If the user/lender wants OnePipeline to handle the loan, the Compliance Engine can transfer the set of tasks for this loan to an internal Loan Processing & Workflow engine **437**. This internal Loan Processing & Workflow engine (Forte Conductor™, Framework Lendware™, etc) (see also **462, 463, 464, 466 and 467** in **Fig. 4C**) will automatically transmit specific tasks to specific workers who have been previously identified as responsible for those kind of tasks **438**, will supply task completion data to the Compliance Engine **440** when tasks are completed. The Compliance Engine will supply the completion data to the system so as to generate worker compensation and loan completion reports (see **468** in **Fig. 4C**), and Completion Certificates **442**. The final process module in the system, the Banking & Loan Management process (**469** in **Fig. 4C**), adds the loan, if it was provided by OnePipeline, and its related financial parameters to the inventory of loans managed by applicants. In a preferred embodiment, this Banking & Loan Management process **469** includes a secondary banking engine which manages the packaging and placing of loans with secondary financial institutions so as to optimize the financial returns on the loans handled by applicants. This process would be managed by Lendware™ via an on-site installation or by a Framework™ application service provider (ASP) or equivalent implementation. In an alternative embodiment, this secondary banking engine which manages the packaging and placing of loans with secondary financial institutions so as to optimize the financial returns on the loans handled by applicants would be a package developed internally by applicants.

A depiction of an alternative embodiment of the present invention is shown in **Figure 5** which describes the elements shown in **Figs. 4A, 4B and 4C** in a different depiction. Each of these features is described in more detail below.

The 'Loan Origination Gateway' **501** or portal, serves as an 'entry point' or gateway to the 'pipeline' or system. The loan originator enters data for both himself and for the borrower. This data is passed to the Authentication module **503** which uses these data as inputs to the Compliance Engine **520**. The Compliance Engine **520** uses these data from its associated worker's description **521** and legal context **523** files to determine whether the loan originator can originate this loan for this property. If so, the Authentication module **503** "authenticates" the transaction and passes the information to the Loan Origination System **505** for analysis of correspondent pricing and for underwriter approval. As indicated above, this function could be performed by the system or through the interface to an equivalent service such as the PremierePricer™ product supplied by GHR Systems™ Inc. Then the loan originator is asked to indicate which tasks he will do (of the optional tasks available) **519**. These optional task and fee data along with the original Loan Originator data and borrower data and underwriter data are then passed to the Compliance Engine **520** wherein the mandatory tasks identified based on the legal requirements for this loan originator and this location of the property, and the selected optional tasks are combined by the Compliance Engine **520** into a required set of tasks for this loan and passed as inputs to the Loan Fulfillment System **545**. The Loan Fulfillment System **545** assembles the inputs and task requirements for input to the Mortgage Workflow Engine **553** which automatically manages the task execution by various responsible parties.

In the process of managing the execution of the required tasks the Mortgage Workflow Engine **553** automatically communicates with parties having an interest in this loan via the Task Maintenance & Status Reporting Gateway **550** and communicates with various service providers via the Transaction Service Provider Gateway **555**. When the loan is finally closed (i.e. all designated tasks completed) this status is communicated to the Compensation & Task Performance Report system **557** for the generation of these reports. The loan completion status is also



communicated to the Secondary Banking & Loan Inventory Management system 563 which adds the completed loan data to the loan inventory and periodically, using a Secondary banking Engine 559, optimally packages certain loans for transfer to secondary funding sources.

Having described a preferred embodiment and an alternative embodiment of the applicants invention, we now describe the major components in more detail. Figures 7 - 11 indicate the basic original entry into the automated system and shows the kinds of data that is inputted. These data are then processed as follows.

#### The 'Loan Application Gateway'

Referring to **Fig. 33**, A loan originator, in any of several manifestations, may originate a mortgage loan request on behalf of a client, a 'borrower'. The 'Loan Application Gateway' provides for the Lender/Loan Originator to enter his data and borrower data **3401** and envisions at a minimum, three (3) ways by which the system may be accessed by a loan originator; (1) via Internet website **3405** of the assignee of the present invention, the data typically being in HTML format; (2) via custom-written software **3403** which connects in a data transmission-enabled manner to the present invention and would typically be in XML format; and (3) via 'wireless' devices, including web-enabled cell phones for voice input, wireless, modem-equipped hand-held or laptop computing devices, satellite communication devices, and other such wireless data and communication methods and devices **3407** as may come into common use, these data typically being in the WML or WAP formats, or other formats as may come into common use. The principle purpose of the 'Loan Application Gateway' **3400**, in serving as a portal, is to provide a way for the loan originator to exchange required data with the "Loan Application System" without having to worry about what input method he is using and/or the related data formats and protocols. Consequently the major purpose of the input gateway is to perform the middleware tasks of - recognizing the input channel and data format and protocol used **3409** and convert the data to the standard Application Programming Interface (API) format **3411** which will be used by downstream modules. This

standard Application Programming Interface (API) format **3411** is described in more detail below in the section covering the Compliance Engine.

The input data originates from the input screens or prompts (either voice prompts or visual prompts) provided by the system. Upon making the connection to the OnePipeline system, the loan originator is presented with introductory screen sets ( Figures 7 - 12) and input screen sets (Figures 13 - 18) whereby the particular information which describes, to the OnePipeline system, the circumstances of the borrower, as well as the property under contemplation for purchase. Suitable reference and 'help' screens are made available to the loan originator to assist in the entry of required data. Notably, display information and on-screen prompts for data input are tailored to the nature and speed of the data link as well as the display limitations of the terminal device in use by the loan originator.

Referring to Figs. 7-18, such data or information is required for originating and underwriting a loan, and typically includes the following: a subscribing loan originator's identification Fig. 7, pertinent information sufficient to identify the pending borrower Fig. 13, and information on the subject property Fig. 14. The subscribing loan originator's identification Fig. 7, in turn, provides the present invention with a profile of the originator and the location of the property in question thereby providing sufficient information to facilitate authentication of the originator's qualification, according to regulations, to originate a loan, and other such information as is deemed necessary to logically connect the originator with agents, workers, or services which have been associated with the originator as 'loan affiliates'.

These 'affiliates' constitute a variety of resources which may be called upon on a loan-by-loan basis to provide services common in the industry, to the originator in order to complete the loan.

When the inputs are by a voice mechanism, such as a cell phone or the like, the system presents menu options to the user in a unique manner which is illustrated below. The system further uses a voice imprint of the Real Estate Sales Professional/agent/originator to authenticate their identity. In a preferred

embodiment an exemplary interchange with a user in the voice mode would be as follows:

### ONEPIPELINE VOICE PORTAL EXEMPLARY OPERATION

5      Application:      Welcome to the OnePipeline Agent Originator Voice Response System. Please identify yourself by saying your first and last name.

10      User:              First Name, Last Name (authenticate based on voice match)

Welcome, First Name, Last Name. This voice activated system allows you to assist your client in obtaining a mortgage loan and get compensated for your efforts.

15      Main Menu: At any point you can give a keyword and bypass the rest of the menu options. If you want to perform consulting activities with your client, say "*Consulting*"; If you need to order various services on behalf of your client, say "*Order Services*." If you need to check loan status, say "*Loan Status*." If you need an update on tasks completed or record that you have completed tasks associated with a particular loan for your client, say "*Task Maintenance*." And if you want to find out about the status of your compensation for services performed, say "*Compensation Status*." At any point during the process you can say "*Good-bye*" to end the session. Now say the keyword or words of the menu selection you would like to proceed to.

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30                              Consulting

Application:      Welcome to the consultation process. You should have already completed the necessary forms with your clients that have the requisite information to determine the maximum home price and loan amount they can afford – key to pre-qualifying your client. There are 11 specific questions. Are you ready with this information?

35

User:                  Yes/No (If no, application says "Please gather this information and call back later." If yes, go forward.

40

Application:      Have you explained all aspects of the consultation step with your client?

User: Yes/No (If no, application says "Please go through this information first with your client before proceeding." If yes, go forward.

Application: At the end of the 11 questions, you should be prepared to write down the 8 responses in the places designated on your form. Now let's proceed with gathering the information. If for some reason you'd like to start from the top during the process, just say "Start Over." Since the accuracy of this information is so important to this process, I'll need to confirm each entry. OK, let's get started:

Number 1: What is the home phone number of the primary borrower, area code first.

User: ###-###-####

Application: ###-###-####, is that correct?

User: Yes

Application: Our records indicate this is (First Name), (Last Name) residing at (street number), (street name), in (city), (state). Is this information correct?

User: Yes (go to question #2), if no say "OK. We'll go on for now, but make sure to go to the web site and update the name and address as soon as possible.

Application: Number 2: Now tell me the home phone number of the co-borrower, area code first, or touch it on the keypad. If there's only one borrower, say "Skip It."

User: ###-###-####

Application: ###-###-####, is that correct?

User: Yes

Application: Our records indicate this is (First Name), (Last Name) residing at (street number), (street name), in (city), (state). Is this information correct?

User: Yes (go to question #3), if no say "OK. Again, make sure to go to the web site and update this person's name and address when you get the chance."

5 Application: Number 3: From the worksheet, please say the total monthly income for all the borrowers. There's no need to include cents. For example, if the actual amount '3,200 dollars and 50 cents', simply say '\$3,200 dollars.'

10 User: \$###,### dollars

Application: \$###,### dollars, is that right?

User: Yes

15 Application: Number 4: Please indicate the total monthly debts, again in dollars only:

User: \$###,### dollars

20 Application: \$###,### dollars, is that right?

User: Yes

25 Application: Number 5: Now tell us the value of their total assets.

User: \$###,### dollars

Application: \$###,### dollars, is that right?

30 User: Yes

Application: Number 6: What amount do your clients intend to use as a down payment?

35 User: \$###,### dollars

Application: \$###,### dollars, is that right?

40 User: Yes

Application: Number 7: What is the anticipated interest rate?

User: ##.## percent

45 Application: ##.## percent, is that right?

User: Yes

Application: Number 8 – and there are only four questions left. What is the desired loan term? You can say 10, 15, 20, or 30.

User: ## years

Application: ## years, is that correct?

User: Yes

Application: Number 9: What is the purpose of the loan? Say “New Home”, “Refinance”, or “Cash.”

User: New Home

Application: Number 10: What loan product is your client interested in? You can say:

“30 year fixed rate loan”

“15 year fixed rate loan”

“Adjustable rate mortgage”

“A loan program with the lowest possible down payment.”

“A loan program with the lowest interest rate.”

“No income verification loan.”

User: 30 year fixed rate loan

Application: 30 year fixed rate loan, is that right?

User: Yes

Application: Number 11 – and the final question: Is the borrower interested in paying points to lower their interest rate; paying no points for a par loan; or having points paid to them to minimize their closing costs?

User: Paying points to lower their interest rate.

Application: You said, “Paying points to lower their interest rate.” Is that right?

User: Yes.

Application: Great! This is all the information we require to do our analysis. While we are performing a few calculations and looking up loans in our database, please be prepared to write down the information as it comes back to you. (pause)

Based on the information provided, our analysis provides the following information for your client. Please write this down on the worksheet. You can browse through this list of information by saying FIRST, NEXT, PREVIOUS, LAST, or REPEAT IT.

Number 12: Your client is eligible to purchase a home for the amount of \$###,###

Number 13: They may qualify for a loan in the amount of ###,###

Number 14: This information is based on a down payment of \$###,###.

Number 15: This will result in a loan-to-value ratio of ##.##%.

Number 16: Although this may change after more consultation with your client, the loan product they have selected is "30 year fixed, paying some points, with an approximate interest rate of ##.##%.

Number 17: Given this information, your client can expect a total monthly payment of \$,### month.

Number 18: Monthly principal and interest will comprise \$,### of that payment.

Number 19: Taxes and insurance should account for the balance, or \$,###.

Number 20: For future processing activities, you will need to track this client by a loan number. The loan number is #####.

Application: You have now completed the pre-qualification step of assisting your client with obtaining a mortgage loan. If you are interested in completing other tasks at this time, say "Menu." Otherwise, say "Good-bye" and this session will be ended.

User: Menu/Good-bye

## Order Services

Application: Welcome to the order services menu. First, we need to know the loan number of the borrower you are representing.

User: ##### (loan number)

Application: #####, is this correct?

User: Yes

Application: Please identify which service you want to authorize the ordering for: say either appraisal, title, or flood.

User: appraisal, title, or flood (branch to particular section)

Application: (Appraisal section) The lender has authorized certain appraisal companies to perform the appraisal on the subject property. Do you wish to use one of their designated appraisers?

User: Yes/No (If yes, go to next section.)

Application: Great. The appraiser will be notified and your records will be updated indicating you have performed this task. Say "Menu" to return to the main menu or "Good-Bye" to finish.

Application: (No Answer). We understand that you have an appraiser you would like to use. Please indicate the number of that appraiser.

User: ###

Application: Great. The appraiser will be notified and your records will be updated indicating you have performed this task. Say "Menu" to return to the main menu or "Good-Bye" to finish.

Application: (Title section) Please identify the title company to be used in ordering title insurance.

User: ###

Application: Great. The title company will be notified and your records will be updated indicating you have performed this task. Say "Menu" to return to the main menu or "Good-Bye" to finish.



Application: (Flood section) Please identify the flood insurance company to be used in ordering flood insurance.

User: ###

Application: Great. The flood insurance company will be notified and your records will be updated indicating you have performed this task. Say "*Menu*" to return to the main menu or "*Good-Bye*" to finish.

### Loan Status

Application: In order to obtain a loan status, we need to know the loan number associated with your client. Please provide that loan number now.

User: ##### (loan number)

Application: #####, is this correct?

User: Yes

Application: Based on their response say: "The status of this loan is: (*Application Received , In Underwriting, Approved with Conditions, Approved with Modifications, Suspended Declined, Preliminary Title Received, Appraisal Received, Cleared to Close*). Please note this information and communicate it to your client.

Say "*Menu*" to return to the main menu or "*Good-Bye*" to finish.

### Task Maintenance

Application: The task maintenance menu allows you get a status of the tasks you have completed and record tasks completed associated with a client's particular loan number. To proceed, say the loan number of the loan for which you want to perform this activities.

User: ##### (loan number)

Application: #####, is this correct?

User: Yes

Application: Do you want to obtain a status of the tasks or record that you have completed certain tasks? Say “*status*” or “*record*”.

User: Status or Record

Application: If “Status”, then say the following: Our records indicate you have completed the following tasks: (i.e.; explained the loan process to your borrower; consulted on your borrower’s income & debt; completed the pre-qualification with your borrower.

Then say, The following tasks are still outstanding: (i.e., review the business disclosure statements with your borrower, review the authorization to verify information to your borrower, etc.)

A summary of this information will be e-mailed to you immediately for your review.

If you have further questions about your tasks completed associated with this or any other loan, please contact OnePipeline Customer Response Center at 800-330-8089. Say “*Menu*” to return to the main menu or “*Good-Bye*” to finish.

User: Menu/Good-Bye

Application: If “Record”, then say the following: Please indicate which tasks you have completed. Make sure you include the keywords from each task in your response.

User: Replies with keywords associated with tasks. (a list will be provided with the named tasks and keywords....)

Application: If you have further questions about the tasks completed associated with this or any other loan, please contact OnePipeline Customer Response Center at 800-330-8089. Say “*Menu*” to return to the main menu or “*Good-Bye*” to finish.

User: Menu/Good-Bye

### **Compensation Status**

Application: Similar questions and answers as in the sections above.

Exemplary details of the voice recognition host translation system and the interface to the loan management system are now described with reference to **Figure 42**. Referring to **Figure 42**, the telephony device **4201** could be a standard telephone or cell phone providing the telephony interface used by Real Estate Sales Professionals to use their voice as an input device for the purpose of providing information necessary to generate transactions into the system.

The (PSTN) **4202** represents the Public Switch Telephone Network through which public telephone calls are transmitted. The (PSTN) **4202** is electronically coupled to the speech server **4220**. The speech server node **4220** comprises computer hardware **4208** dedicated to receiving voice related inputs through the PSTN **4202** and converting those inputs into a digital format capable of being processed by a modern computer system. The speech server node **4220** further comprises software technology, a VXML Interpreter **4203** that takes commands from various engines (items **4204**, **4205**, & **4206**) and translates that information into XML data strings which are then sent to the Web Server **4230** for processing.

The Automated Speech Recognition engine **4204** is a software engine that takes voice input and translates that into recognizable words and phrases that can be interpreted by the computer as words or sounds signifying data and events meaningful to the invention. For example, the Real Estate Sales Professional could supply a statement saying "Loan Status" and the Automated Speech Recognition engine would interpret that spoken dialogue into a text string of the same name thus enabling the invention to determine what processing activities should take place within the scope of the application. The Text To Speech engine **4205** is a software engine that takes textual strings produced by computer output and converts that to understandable human audible sentences that provide meaning and context to the application. An example of this could be an inquiry by the Agent Originator concerning "Loan Status." The inquiry into the invention could determine that the status of the loan is "In Processing." The phrase "In Processing" could be transmitted to the Text To Speech engine **4205** and translated into the audible phrase replayed over the telephone saying "In Processing."

The Verification engine **4206** is a software engine that takes biometric readings of the voice of the person providing the input and translates their voice print into a digital format so that their entry can be compared against all stored entries to authenticate a person's identity. This is a process much like finger printing a person to authenticate their identity. Within the context of the invention, it is necessary to identify and ensure that people are who they say they are. The Verification engine **4206** is the software technology that allows the present invention to authenticate Real Estate Sales Professionals and other users of the invention to prevent unauthorized use and tampering of sensitive financial data representing their customer, the borrower. These various engines **4204**, **4205** & **4206** interface with the Computer Telephony hardware **4208** through a standard application programming interface (API) **4207** depending on the particular telephony hardware in use. In the preferred embodiment, telephony hardware supplied by Intel Dialogic™ is employed. An alternate telephony system is supplied by Picazo™. Those skilled in these arts will recognize that the API used is easy to determine given the type of telephony hardware employed..

The speech server **4220** is electronically coupled to the Internet **4209** which is also coupled to applicants' web server **4230**. The web server **4230** comprises the software programs and data unique to the applicants' system of mortgage loan process compliance management , the VXML documents **4210**. It is through these documents that data is sent to and retrieved from applicants' databases. When data is sent to the Web Server **4230** from the Speech server **4220** in the form of an XML string, the Web Server **4230** interprets the request through the use of these VXML Documents **4210**.

The various software systems for processing the loan which are described elsewhere in this application are here characterized as Business Logic **4211** which is the underlying logic contained in the various sub-programs that apply business rules and algorithms to reflect data input and output of applicants' database. The Business Logic **4211** is able to take any set of data from any kind of interface, whether it comes from voice or a web interface, and process that information into meaningful output so Real Estate Sales Professionals can perform their

responsibilities in a legal and lawful manner as described more specifically throughout this application. The Database Back-end 4212 is the repository of dynamic data representing information about the laws, regulations and data pertaining to loans originated by Third Party originators.

As those skilled in these arts will recognize the speech input and output system is but one form of input and output into this system as described more fully herein. The specific functions of the possible functions comprising this mortgage loan processing system are now described in more detail.

#### The Authentication System.

In a preferred embodiment of the system, a Lender may make use of the OnePipeline system merely to obtain the set of tasks required for a specific loan, including tasks required by applicable federal and/or state law, and to obtain a Completion Certificate, or he may originate a loan through OnePipeline's network of Loan Originators also obtaining a Completion Certificate based upon the systems monitored performance of the required tasks involved. In either case the Loan Originator's qualifications are not verified by the Compliance Engine. That is, the Compliance Engine does not check the lenderID and property location to determine whether this Loan Originator is qualified to represent this loan applicant.

In an alternative preferred embodiment, this authentication of the loan originator/lender is performed. This process will now be described. Upon completion of data entry by the loan originator, the OnePipeline system launches a validation or 'authentication' process 403 in Fig. 4A and 503 in Fig. 5. The authentication module verifies the identity of the loan originator through the use of conventional means, a security 'login' typically requiring user names and passwords, which are programmatically verified as belonging to the loan originator. Various data security mechanisms may be incorporated in this sub-system as well, including the use of digital signatures as required. The completeness of the required input data is also verified. The Authentication module also authenticates the loan originator as being qualified to originate a

loan for the property location specified. The module gets the loan originator and borrower input data 401 and calls the 'Compliance Engine' 405, to determine whether the loan originator can originate this loan. If the initial queries to the legal context databases (these are described in more detail below with respect to the compliance engine description) indicate that the loan originator is not qualified then this "not-qualified" data is returned to the loan originator. If the loan originator is found to be qualified to originate loans in the locality a "yes" is returned and the authentication module may instruct the Compliance Engine to complete a "worker profile" for this loan originator, borrower and property.

#### The Automatic Compliance Engine

The Automatic Compliance Engine (the "**Compliance Engine**"), (458 in Fig. 4C and 520 in Fig. 5), is now described in a preferred embodiment. The Compliance Engine is called a number of times by several modules.

As described above, many government, professional, and business institutions impose requirements on land and mortgage lending transactions. A requirement can be the disclosure of specified information to the borrower, filling out a required form, or the gathering of specified information, to name a few. OnePipeline.com, Inc. retains the services of legal professionals throughout the country who continuously gather these requirements and organize them into a comprehensive rule base. The purpose of the Automated Compliance Engine is to apply these rules in an automated way to identify all requirements that apply to a specific loan and to track the completion of those tasks. The output of the engine is a task list comprised of all the tasks which the engine has determined need to be completed for a specific loan, augmented with task completion information for completed tasks.

In a preferred embodiment, the task list is prepared by selecting a subset of tasks from the list of all task definitions known by the Automated Compliance

System. Tasks are selected by evaluating expressions written in a dynamically interpreted programming language that test facts pertaining to the specific loan information. If the expression evaluates to true, then all tasks associated with that expression are added to the task list. All of the expressions in the rule base are sequentially evaluated for each loan instance. The Automated Compliance Engine is thus a rule based system, where each expression represents the 'if' part of a rule, and the subset of tasks associated with the expression represents the 'then' part of a rule.

For example, the following is a set of tasks for a given context:

```

<context>
  <id>12</id>
  <name>Texas</name>
  <if>val('loan.property.address.state') == 'TX'</if>
  <then>
    <taskName>TX Mortgage Broker/Loan Officer Disclosure</taskName>
    <taskName>Property Disclosure--Seller to Buyer</taskName>
    <taskName>TIL</taskName>
    <taskName>URLA</taskName>
    <taskName>Right to Receive Appraisal Disclosure</taskName>
    <taskName>TX Residential Construction Contract Disclosure</taskName>
  </then>
</context>

```

Once required tasks are identified, the engine applies lender task profiles in order to override task description, the URL to print a form, and other task information provided in the standard task definitions with more specific values from the Lender Task Profiles. This allows a high degree of flexibility in customizing the engine for specific lender requirements, including changing the wording of the description of the task or changing the form that must be filled out.

Once the task list has been initially prepared, it is presented to those persons responsible for completing the tasks. This may be as a simple task list transmission to a lender who is doing his own loan origination and/or processing and simply wants OnePipeline to monitor task completion, or it may be an

automatic transmission to an automated workflow process engine. In a preferred embodiment, the automated workflow process engine may be Framework™ Inc.'s "Lendware™" program or a functional equivalent, such as one based on Forte Software™ Inc.'s Forte Conductor™ product. In this case the Workflow process engine presents the tasks to the persons identified as being responsible for doing the task.

As each task is completed, the Compliance Engine receives notice of the completion event and the task list is updated to include the identification of the person completing the task and the date and time of completion. The task list is considered completed when all required tasks have a completion date. Compensation may be issued to those who performed specified tasks with assurance that all required tasks have been completed and that the compensation is within the bounds of the laws and policies of the participating institutions.

#### Data Representation

In the preferred embodiment, all Compliance Engine inputs and outputs are represented externally in Extended Markup Language format (XML) which is described in the document found at [www.w3.org/TR/1998/REC-xml-19980210](http://www.w3.org/TR/1998/REC-xml-19980210) which is incorporated fully herein by reference. XML provides an extensible hierarchical data structure where each element of information is labeled with a tag and optionally contains a value and any number of child elements. Internally, the same information is represented and manipulated in a standard tree format using the Document Object Model tree (DOM) which is described in the document at [www.w3.org/TR/REC-DOM-Level-1/level-one-core.html#ID-1590626202](http://www.w3.org/TR/REC-DOM-Level-1/level-one-core.html#ID-1590626202) and which is incorporated fully herein by reference. Conversion between internal and external representation is provided by output methods of the DOM tree implementation and input methods of the Java API for XML Parsing (JAXP) which is described in the document at the URL [java.sun.com/xml/docs/api/](http://java.sun.com/xml/docs/api/) which is incorporated fully herein by reference.

For convenience in referring to DOM tree elements, but not of necessity, the tree implementation is extended to provide easier tree traversal using a simple "get(String path)" method that takes a path argument such as 'task.name'. The



tags between the dots '.' are parsed out of this path and used to search for corresponding elements in the tree. In this example, the get method searches for the first-occurring element of the tree with tag "task". Once found, the get method then searches for the 'name' tag among the child elements of the 'task' element, and so on for all the tags listed in the path. Further descriptions herein will use this path notation to refer to specific data elements in the data model trees defined below.

Alternative ways to represent and access the information could include files, objects, database records, arrays, structs, TCP/IP socket streams, 'if-then-else' statements in a programming language, or other ordinary means for representing structured information.

#### Data Mode

In recognition of the need to automate as many of these activities as possible, to the mutual advantage of the real estate and mortgage loan community, the Mortgage Bankers Association of America (MBAA) recently originated an effort to develop data structure standards to provide standardization of common business transactions in the mortgage industry. This effort is coordinated by a workgroup of mortgage industry representatives and is called the Mortgage Industry Standards Maintenance Organization (MISMO). Initial deliverables of MISMO include 1) an XML Transaction Architecture to encompass data exchanges from loan origination, the secondary market and servicing; 2) a data dictionary to provide business definitions and corresponding tag names of each of the data elements included in the architecture; and 3) a data model to provide relationships between the elements in the business data. The current versions of these deliverables are contained at [www.mismo.org](http://www.mismo.org) and are fully incorporated herein by reference.

This description refers to the detailed data model in the MISMO web site mentioned above ([www.mismo.org](http://www.mismo.org)). The Data Model is described therein as follows:

“The Data Model is a tool used to understand the relationships between the data elements in the data dictionary. It is a reference to aid in building the XML DTD's. This is not the XML implementation of the MISMO Standard..”

5 MISMO Data Model Documentation

- Address
- Address Definitions
- Agreement
- Agreement Definitions
- 10 • Entities Attributes
- Entity Listing
- MBA Data Model
- Credit Report
- Party
- 15 • Party Credit Definitions
- Party Declarations Definitions
- Party Finance
- Party Finance Item Definitions
- Party Person Definitions
- 20 • Product
- Product Definitions
- Property
- Property Definitions
- MBADataModel v1.ER1

25

The Compliance Engine XML/HTTP Transaction API described below includes Example values for clarification.

The core knowledge of compliance requirements is represented in the 'rules' structure, consisting of 'rules.contexts' and 'rules.operations'. Each 'rules.contexts.context' represents an if/then rule, where the 'context.if' part

describes a specified loan situation (context), and the 'context.then' part is a list of 'taskname' references to the tasks that are required in that context. Each 'context.if' definition is expressed in a programming language statement that examines the facts of a specific loan and evaluates to true or false, as described in the algorithm description below.

Each 'rules.operations.task' defines detailed information about a specific task, independent of the contexts in which it may be required. This information includes a description of the task, a URL link to any forms that may be required for the task, a time period within which the task is expected to be completed, and potentially other information pertinent to a task. References from the context structure in each 'rules.contexts.context.then.taskname' are matched with the corresponding name in 'rules.operations.task.name'. In this manner, a detailed task definition is associated with one or more specific contexts, by task name reference.

This separation between tasks and contexts is a convenience that allows a task to be defined in a single place yet be associated with multiple contexts. Alternatively, the 'rules.operations' list could be eliminated by replacing every 'rules.contexts.context.then.taskname' with an equivalent 'task' structure as presently defined in 'rules.operations.task', although many of the tasks would need to be defined and maintained redundantly in this mode.

Elements of a 'rules.operations.task' definition may be overridden by a corresponding element in an 'override.tasks.task' definition whose 'rules.operations.task.name' matches the 'override.tasks.task.name'. This allows customization by supplying customer-specific information in the task definition, such as a customer-specific form, description in more familiar language, or any other task definition element. Any number of 'override' structures may be applied in sequence, each overriding the result from the previous 'override' application. This allows overrides from customers, and their brokers, agents, and other affiliates to be applied in any desired priority ordering that ultimately determines which override changes will be final. The method of applying the override information is described in the algorithm below.

The 'loan' structure contains all the information pertaining to a specific loan application. The loan application contains information about the borrower, the property to be mortgaged, its location, the loan amount, and the type of loan applied for. This is the information that is evaluated by the 'rules.contexts.context.if' expression to determine whether the conditions specified in the context definitions are true in the case of a specific loan.

### **Compliance Engine XML/HTTP Transaction API**

The Compliance Engine Application Program Interface (API) defines structures for communication between the Automated Compliance Engine and the external environment. The request is initiated by an external agent with accompanying request parameters described below, and the response is a complete Task Status Report consisting of the 'tasks' list output of the engine plus the completion information of completed tasks. Each output 'tasks.task' defines a task that the engine has determined is required in the case of the specified loan. The list will typically be a subset of all defined tasks. Each task includes the detailed task definition information from 'rules.operations.task', with some elements possibly overridden by corresponding task override information from 'override.tasks.task'.

Data is exchanged via pre-authenticated HTTP in XML format (DTD available). It is presented in indented format for readability. All XML elements are required.

The lender must provide, for each loan product, a description containing the product attributes that are required for compliance analysis, such as whether ARM, fixed, balloon, index, etc. Each loan application is linked to this information via the loanProductId compliance parameter, described below. This must be updated whenever the product attributes change.

The MISMO standard mentioned above contains most of the information required by the Compliance Engine to perform its work, but not all. The key missing pieces are the type of loan product the borrower is applying for, and the lender and agent identification.

Loan products differ from each other in terms of whether they are adjustable rate (ARM) or fixed, whether the rate is tied to T-bills or some other index, whether there is a Balloon payment, whether the property will be owner occupied or rented out, whether there is cash out or not, etc.

The loan product information is complex, and there are several compliance rules that arise out of different characteristics of the lender's loan product. In a preferred embodiment, rather than try to identify all facets of the loan product in a structured way and apply rules each time those facets are examined, instead, the loan product information is analyzed by hand, one time, up front, and a decision is made as to what compliance tasks are required for that type of loan. Then when it's time to generate a task list, there is a single rule that indicates if you have loan product type XYZ then you must do tasks 1, 2, and 3. The main piece of information that is not provided by MISMO is the loan product ID, which is the id given the loan product by a lender.

Besides the loan product ID, the compliance API also requires the lender id, which is used in conjunction with the loan product id to fully identify the loan product, and it also tells us where the loan originator's pay will come from, which lender profile to apply, the lender to send notifications to, etc. The API also requires the loan originator agent id, which identifies who the loan originator is so he/she can be paid appropriately when that time comes. The loan originator id is assigned by OnePipeline.

The lender may also provide a task list profile that defines override values for task.description and task.form for any task. These values override the OnePipeline default values for these fields, if present. This allows lenders to describe tasks in their preferred terminology and to use their own forms, subject to compliance requirements.

These data provided via the Loan Application Gateway 3400 (described above) include the following exemplary type data:

#### **New Task List Transaction**

This transaction creates a new loan compliance record in the OnePipeline compliance database, and creates the task list.

**Input:**

```

5      complianceRequest
      requestType newTaskList      //same as HTTP Request-line URI resource
      lender (loan)
          lenderId                  //onpipeline assigned
          lenderLoanId             //lender assigned
          agentId                  //loan originator, onpipeline-assigned agentId
10      loan                        //loan compliance parameters.
          loanOriginationFee       //$. Requires review if over 1% of loanAmount.
          loanProductId            //must match id in lender-provided product
                                   spec.
          loanAmount
15      propertyType               //single, multiple, occupied, etc., from list
          financingOptions         //cash out, refinance, purchase, etc., from list
          state                    //property location, 2-letter state code

```

**Output: Task Status Report (see below)****Update Transaction**

This transaction updates the loan compliance record when one or more tasks are completed, or when loan compliance parameters are changed. If loan compliance parameters are changed, a new task list is generated, and the old one is moved to the taskListArchive section. Task completion information is retained in both the current task list and in the archived task lists.

**Input:**

```

30      complianceRequest
      requestType update
      lender (loan)
          lenderId
35      lenderLoanId
      tasks
          task
              taskId               //matches taskId from task in task list
              agentId              //onpipeline agent id
40      completedDate             //date and time in SQL format
          task
              taskId
              agentId

```

```

        completedDate
    ...
    loan
        loanOriginationFee    //$. Requires review if over 1% of
                               loanAmount.
5        loanProductId        //must match id in lender-provided product
                               spec.
    loanAmount
        propertyType          //single, multiple, occupied, etc., from list
10        financingOptions    //cash out, refinance, purchase, etc., from list
        state                //2-letter postal state code: NY, CA, TX, etc.
        selfEmployed          //Y or N

```

**Output: Task Status Report (see below)**

### 15      **Task Status Report Transaction**

**Output:**

Format and structure is the same for all transaction types. When changed loan compliance parameters require regenerating the task list, old task lists are preserved in the taskListArchive section. Completion information is present only for completed tasks, in both tasks and taskListArchive sections.

```

complianceResponse
    requestType taskStatusReport
25    httpStatus          //Same as HTTP response code. Success: 200 OK

    lender {loan}
        lenderId
        lenderLoanId
30    date                //status report date and time in SQL format
    tasks
        task
            taskId          //onpipeline unique task id number
            taskName        //onpipeline unique task name
35            displaySequence
            lenderTaskName
            description      //may be overridden via lender profile
            form             //PDF printable form URL. May be overridden.
            stepNumber       //HUD step 1, 2, 3, 4, or 5
40            completion    //Present only for completed tasks
            agentId          //onpipeline agent id
            completedDate    //date and time in SQL format

```

```

        task                                //same as above
    "
    taskListArchive
        archiveDate (date)                  //date moved into taskListArchive
5         date                             //task list creation date and time, in SQL
format
        lender (loan)                      //same as lender structure above, as of date
        ..
10         tasks                          //same as tasks structure above, as of date
        ..

        loan (loanProductData) //same as request, with replaced loanProductId
information
        ..
15         archiveDate (date)
        ..
        stepCompletion (completion)
        step (stepNumber x)
            stepNumber                      //HUD steps 1, 2, 3, 4, and 5
20             complete                    //Y or N
            feePercent                     //percentage to be paid for this step
            fee                           //feePercent * loanOriginationFee, $
            agentId                       //onepipeline agent id if agent completed
            agentPayable                   //fee $ if agent completed, else zero
25             step                        //same structure as above
            ..
            step
            ..
            step
30             ..
            step
            ..

```

### Algorithm

35 Refer to the description of XML, JAXP, and DOM in the data representation description above, and to the data model description and detail data model elements also described above.

At startup, the Automated Compliance Engine reads the XML-formatted 'rules' from external storage into memory. This XML stream is parsed by the  
40 JAXP parser into a DOM internal tree. For each 'rules.operations.task', the 'task.name' is used as a key in adding task detail definition elements to a java.util.Hashtable to enable looking up a task definition by 'task.name'.



Similarly, an array is loaded with each 'task' indexed by 'task.id', to enable looking up each task by the unique 'task.id' integer value. A separate hashtable is loaded with task override information for each lender, again using the 'task.name' as the key. Also, a socket connection to a network is opened by a web server or other HTTP service to enable Compliance Engine users to submit requests to the Compliance Engine server and to return responses. HTTP socket connections are describer described in the document found at [www.w3.org/Protocols/rfc2616/rfc2616.html](http://www.w3.org/Protocols/rfc2616/rfc2616.html) and which is incorporated fully herein by reference.

Once initialized, the Compliance Engine server operates in a stateless request-response fashion, similar to a web server, following the HTTP protocol. Alternative protocols could be used. The request and response are both formatted externally in XML format, and internally in DOM trees, as described in the data representation description above.

The Compliance Engine API provides for three different request types: New Task List, Task Completion, and Task Status Report. These are described below. The response in all cases is a Task Status Report containing a 'tasks.task' list. The remainder of this algorithm section describes how the task list is created or updated in response to these requests.

The Compliance Engine also incorporates an 'event generation mechanism', the purpose of which is to trigger actions upon the occurrence of specified events. These events may include a 'pushed' report where a task list is periodically updated according to specified parameters and delivered.

#### **New Task List**

The New Task List request consists of a 'loan' structure that contains information about a specific loan sufficient to determine which compliance tasks are required.

The 'tasks.task' list is prepared as follows. Each 'rules.contexts.context.if' expression is evaluated, one at a time, in a loop from first to last. The 'if' expression is written in the JPython programming language, which is an interpretive scripting language that can evaluate string expressions at runtime.

The Python Programming Language is described in the book "Internet Programming with Python" by Aaron Waters, Guido van Rossum and James C. Ahlstrum, M & T Books (Div. of Henry Holt & Co.) 1996, which is incorporated herein by reference. Other languages could be used. The expressions typically reference a specific element in the 'loan' structure to see if the element contains a specific value.

For example, to determine if the loan property is in the state of Utah, the expression could be `"val('loan.property.address.state') == 'UT'"`. The `"val()"` method takes a string describing a path into a DOM tree, and returns the first value of the first DOM node found on that path. If the actual value of the 'loan.property.address.state' node of a specific loan was 'UT', the expression evaluates to true, otherwise false. When such an 'if' expression evaluates to true, all of the associated 'rules.contexts.context.then.taskname' references are followed by using the 'taskname' value as a key to look up the referenced task detail definition through a java.util.Hashtable populated at startup.

After finding the task detail in the hashtable, the 'rules.operations.task.name' task detail definition structure could be copied directly to an output task list; however, for convenience in the preferred embodiment, the integer value of the included 'rules.operations.task.id' element is used to set a corresponding bit in a java.util.BitSet. This 'id' integer value is unique for each task in the 'rules' set. After all rules have been evaluated and all applicable bits are set, the resultant BitSet contains a true bit for every task with a true 'if' expression. The BitSet thus represents the subset of all tasks which the Compliance Engine has determined to be required in the case of the specified loan. The purpose of this BitSet representation is to allow, in the future, rapid and simple boolean operations (and, or, or not operations on the BitSet) to combine task lists from different rule sets to improve flexibility and/or increase performance. One way to increase performance, for example, is to create a BitSet at startup time from a rule set that contains contexts that are always true for every loan. This initially created BitSet can be combined with the dynamically created

BitSet using a bitwise 'and' operation in a manner that avoids unnecessary re-evaluation of some rules.

Once a final BitSet is constructed, the program loops through each bit in the BitSet, and where a true bit is found in a particular bit position, the bit position is used as the index to retrieve the corresponding 'task' definition structure from the array that was indexed at startup time using the matching 'task.id' integer value. This 'task' detail definition structure is then copied and the copy appended to the DOM output tree containing the output task list.

After constructing the list of task detail definitions for all required tasks, the task override information is applied. This is accomplished by iterating through each task on the output task list, and looking up the task override information for the lender specified in the request. If a task override structure is present in the table, then the program loops through each element in the override structure task definition and replaces the corresponding element in the output task definition. For example, if the override task structure includes a lender-provided task description, then the value of that description is copied over the top of the more generic description from the original rules structure.

### **Exemplary task list**

An exemplary task list generated by the Compliance Engine in a preferred embodiment is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<rules>
  <contexts>
    <context>
      <id>1</id>
      <name>all loans</name>
      <if>true</if>
      <then>
        <taskName>GFE</taskName>
        <taskName>Transfer of Servicing Disclosure</taskName>
        <taskName>FLN</taskName>
```

```

<taskName>ECOA</taskName>
<taskName>Flood Insurance Disclosure</taskName>
  </then>
  <phase />
5  </context>
  <context>
    <id>57</id>
    <name>Wyoming</name>
    <if>state('WY')</if>
10  <then>
    <taskName>TIL</taskName>
    <taskName>URLA</taskName>
    <taskName>Right to Receive Appraisal Disclosure</taskName>
    <taskName>Finance/Lock-in Disclosure</taskName>
15  </then>
  </context>
  <context>
    <id>12</id>
    <name>Texas</name>
20  <if>val('loan.property.address.state') == 'TX'</if>
    <then>
    <taskName>TX Mortgage Broker/Loan Officer Disclosure</taskName>
    <taskName>Property Disclosure--Seller to Buyer</taskName>
    <taskName>TIL</taskName>
25  <taskName>URLA</taskName>
    <taskName>Right to Receive Appraisal Disclosure</taskName>
    <taskName>TX Residential Construction Contract
    Disclosure</taskName>
    </then>
30  </context>
  <context>
    <id>103</id>
    <name>Texas and Loan Amount > 50000</name>
    <if>((val('loan.property.address.state') == 'TX') &
35  (ival('loan.loanAmount') > 50000))</if>
    <then>
    <taskName>TX Commitment/Lock-in Disclosure</taskName>
    </then>

```

```

    </context>
  </contexts>
  <operations>
    <task>
5      <id>56</id>
      <name>TX Commitment/Lock-in Disclosure</name>
      <description>The borrower must receive a Commitment/Lock-in
Disclosure form.</description>
      <form>http://forms.onePipeline.com/TX_Commitment_Lock-
10    in_Disclosure.pdf</form>
      <role>originator</role>
      <feePercent>15</feePercent>
    </task>
    <task>
15      <id>3</id>
      <name>TIL</name>
      <description>The borrower must receive the Truth In Lending
disclosure.</description>
      <form></form>
20      <feePercent>15</feePercent>
      <role>originator</role>
    </task>
    <task>
      <id>1</id>
25      <name>URLA</name>
      <description>The borrower(s) must sign and return the
completed Uniform Residential Loan Application.</description>
      <form>http://forms.onePipeline.com/FNMA_1003.pdf</form>
      <role>originator</role>
30      <feePercent>10</feePercent>
    </task>
    <task>
      <id>2</id>
      <name>GFE</name>
35      <description>The borrower must receive the Good Faith
Estimate.</description>
      <form>http://forms.onePipeline.com/Good_Faith_Estimate.pdf</form>

```

<feePercent>10</feePercent>  
 <role>originator</role>  
 </task>  
 <task>  
 5       <id>4</id>  
       <name>Transfer of Servicing Disclosure</name>  
       <description>The borrower must complete, sign, and return  
 the Transfer of Servicing Disclosure Statement prior to  
 closing.</description>  
 10  
 <form>http://forms.onePipeline.com/Servicing\_Disclosure\_552R.pdf</  
 form>  
       <role>originator</role>  
       <feePercent>5</feePercent>  
 15       </task>  
       <task>  
           <id>6</id>  
           <name>PLN</name>  
           <description>The borrower must receive the Fair Lending  
 20       Notice.</description>  
 <form>http://forms.onePipeline.com/Fair\_Lending\_Notice.pdf</form>  
       <feePercent>5</feePercent>  
       <role>originator</role>  
 25       </task>  
       <task>  
           <id>7</id>  
           <name>EOCA</name>  
           <description>The borrower must receive the Equal Credit  
 30       Opportunity Act disclosure.</description>  
 <form>http://forms.onePipeline.com/Equal\_Credit\_Opportunity\_Act\_Di  
 sclosure.pdf</form>  
       <feePercent>5</feePercent>  
 35       <role>originator</role>  
       </task>  
       <task>  
           <id>8</id>

<name>Flood Insurance Disclosure</name>  
 <description>The borrower must receive the Flood Insurance  
 Disclosure.</description>

5 <form>[http://forms.onePipeline.com/Flood\\_Insurance\\_Disclosure.pdf](http://forms.onePipeline.com/Flood_Insurance_Disclosure.pdf)<  
 /form>

<role>originator</role>  
 <feePercent>10</feePercent>  
 <originatorDays>30</originatorDays>

10 </task>  
 <task>

<id>5</id>  
 <name>Right to Receive Appraisal Disclosure</name>  
 <description>The borrower must receive the Right to Receive  
 15 Appraisal Disclosure.</description>

<form>[http://forms.onePipeline.com/Right\\_To\\_Receive\\_Appraisal.pdf](http://forms.onePipeline.com/Right_To_Receive_Appraisal.pdf)<  
 /form>

<role>originator</role>  
 20 <feePercent>0</feePercent>

</task>  
 <task>

<id>10</id>  
 <name>Finance/Lock-in Disclosure</name>  
 25 <description>The borrower must receive the Finance/Lock-in  
 Disclosure.</description>

<form>[http://forms.onePipeline.com/Finance\\_Lock\\_in\\_Disclosure.pdf](http://forms.onePipeline.com/Finance_Lock_in_Disclosure.pdf)<  
 /form>

30 <role>originator</role>  
 <feePercent>0</feePercent>

</task>  
 <task>

<id>55</id>  
 35 <name>TX Mortgage Broker/Loan Officer Disclosure</name>  
 <description>The borrower must receive a Mortgage  
 Broker/Loan Officer Disclosure.</description>

<form>http://forms.onePipeline.com/TX\_Mortgage\_Broker\_Loan\_Officer  
\_Disclosure\_1048TX.pdf</form>

<feePercent>5</feePercent>

<role />

</task>

<task>

<id>54</id>

<name>Property Disclosure--Seller to Buyer</name>

<description>The property disclosure must be completed and  
kept with loan documents.</description>

<form>http://forms.onePipeline.com/Property\_Disclosure\_Seller\_to\_B  
uyer.pdf</form>

<role>originator</role>

<feePercent>0</feePercent>

</task>

<task>

<id>211</id>

<name>TX Residential Construction Contract Disclosure</name>

<description>The borrower must receive the TX Residential  
Construction Contract Disclosure, which is to be provided by the  
contractor for new construction.</description>

<form>http://forms.onePipeline.com/TX\_Residential\_Construction\_Con  
tract\_Disclosure.pdf</form>

<role>originator</role>

<feePercent>0</feePercent>

</task>

</operations>

</rules>

</overrides>

<tasks>

<task>

<name>TX Mortgage Broker/Loan Officer Disclosure</name>

<description>Execute ABC Company Loan Officer  
Disclosure.</description>



```

<form>http://forms.ABC.com/ABC_Loan_Officer_Disclosure.pdf</form>
  <role>Loan Originator</role>
</task>
5   <task>
      <name>TX Residential Construction Contract Disclosure</name>
      <description>The borrower must receive the ABC Company
Residential Construction Contract Disclosure.</description>

10  <form>http://forms.ABC.com/ABC_Residential_Construction_Contract_D
isclosure.pdf</form>
      </task>
    </tasks>
      </override>

```

In a preferred embodiment, the original compliance task list for a specific loan is transmitted to the lender for Compliance Management or passed to an automated workflow engine to initiate the dynamic workflow process. **Figures 37-41** contain a set of system screen shots showing an exemplary list of tasks required to complete a sample loan.

#### **An alternative embodiment**

In an alternative embodiment, a more general compliance system may be used, and is now described with reference to **Figure 5**. Referring now to **Fig. 5**, the 'Originator and Processor Compliance Engine' **520** is comprised of two principle elements - the 'Worker Description' **521** and the 'Legal Context' **523**. These elements are described in their preferred embodiments as follows:

The 'Worker Description' **521** comprises an assemblage of data sources which define the types **525**, roles **527** and locations **529** of the workers or agents which may participate in the mortgage origination process. The participation decision for a worker or agent is based upon the combination of features which the worker embodies and which make them unique when combined one with another. In the preferred embodiment, the worker provides a data profile representative of the worker's type - that is, the type of service the worker may

provide. The worker is typically representative of only one 'type' for example, either a 'Real estate sales professional', 'mortgage broker', 'banker', etc.. The specific 'role(s)' that a particular worker or agent has in the process is/are also defined. The 'role(s)' that a worker assumes are aligned with the tasks requiring completion which a worker of that type can legitimately perform, according to the governing rule base for that specific worker type. These 'roles' may include such tasks as surveys, inspections, credit worthiness checks, employment verification, etc.. Orchestrating the interrelationship of these information sources is a 'Role Sequencing' definition or data table which assures a meaningful, orderly, and legal application of the available data. Those skilled in these arts will understand that various methods similar to those described above in a preferred embodiment could be used for such sequencing activities. In an exemplary process the data passed from the Authentication module includes the loan originator used ID. This user ID is used as an argument to find the recorded worker type in the Worker's description databases where a user ID1, for example, would produce a Type ID1. This type ID1 would then be used to find the corresponding roles for this type of user and to determine the locations where this user id is licensed/qualified to do business. These data are written into a 'worker's profile' structure.

Referring again to **Figure 5**, the 'Legal Context' **523** could comprise an assemblage of data sources which would contain the regulatory elements pertinent to the compliance and underwriting process as required by the 'Originator and Processor Compliance Engine' **520**. Included in this element would be tables and other data sources which are typically comprised of state and county regulations **531** similar to those described above with reference to the preferred embodiment, licensing regulations **533**, federal regulations **535**, and professional organizational rules **539**, all of which may govern or otherwise influence the underwriting process. Orchestrating the interrelationship of these information sources would be a 'Rule Sequencing' engine **541** which assures a meaningful, orderly, and legal application of the available data. When the 'Role Sequencing' data table and 'Rule Sequencing' **541** engines have completed the required processing, a profile **543** or a composite of the borrower requirements and property profile with

applicable worker attributes is made available to the other modules as required (i.e. the Authentication module, Loan Origination module, workflow engine, and Task maintenance & status reporting gateway module).

5                   The 'Loan Application & Program Matching System'

Referring again to **Figure 4C**, the 'Loan Origination & Program Matching System' **456**, (also see **505** in **Fig. 5**) is comprised of a multiplicity of sub-systems, to be later described. After this loan originator has been 'authenticated' as described above, this system serves as an infrastructure to identify various loan products or instruments suitable for this unique combination of borrower and property, and further offering a preferred recommendation of loan products and participating workers or agents to effect the loan. The system communicates with the loan originator and requires him to complete the actions and provide the additional borrower data and instructions shown in Figures 12 - 17.

15                   As indicated above, in the preferred embodiment of the invention, this Loan Application & Program Matching System' is preferably performed by a system such as GHR Systems™ making use of their PremierWare™ product. This GHR product is also an object oriented product, however the objects employed are Microsoft COM™ objects which require Windows NT™. The web server architecture of applicants system is UNIX based which necessitates using Java and the Common Object Request Broker (CORBA) system to communicate between the UNIX and COM based object systems. The architecture of this communications interface is described below with reference to **Figure 34**.

20                   With reference to Onepipeline's use of this PremierWare™ product, the following description pertains. The input and output data elements that play a role in OnePipeline.com, Inc.'s use of the GHR Underwriting Framework known as PremierWare are now described. OnePipeline implemented the framework within a distributed architecture encompassing several technologies including Java, CORBA, COM, and Delphi (Object Pascal). First, how the GHR components interact with each other are described, followed by the OnePipeline implementation around that interaction.

GHR Systems' PremierWare framework is a set of software components that adhere to the component object model (COM) sponsored by Microsoft. Inc. The framework is provided to facilitate the qualification of borrower credentials, i.e., income, debts, etc., against mortgage loan programs. The desired result being to locate a loan program for which the borrower is qualified. The framework is functionally divided internally representative of three primary operations:

- Product Filtration: Narrowing the number of programs available for qualification processing.
- Qualification: Extracting the programs for which the borrower is qualified to apply.
- Ancillary Utilities (Helping): Packaging and unpacking data as it moves in and out of the GHR API.

#### Product Filtration

If no product filtering is performed before qualification, then qualification processing is completed on all products in the GHR products database. Filter criteria can be set using any or all of the data elements below:

GHR Term	Date Type
LenderID	String (bstr)
MaxReturnedProduct	Integer
Modbits	Integer
PropertyState	String i.e., 'UT'
PropertyCounty	String
PropertyZip	String
LockType	Integer
LockDays	Integer
PricePreference	Integer
SpecificRate	Integer

SpecificPoints	Integer
AllLoans	Boolean
FHALoans	Boolean
VALoans	Boolean
ConventionalLoans	Boolean
FixedRateMortgages	Boolean
AdjustableMortgages	Boolean
BaloonMortgages	Boolean

The result of a Product Filtering operation is a set of loan programs that serve as the input to a Qualification operation. Within the framework, the Pricer object's GetProductsForQualification method is used to perform a filtering operation. Once a set of loan programs is received from GetProductsForQualification, then qualification can commence.

### Qualification

The first step in qualification is selecting a Qualification Method. There are fourteen methods in total, which are grouped into four Modes. The four Modes are:

- Buyer/Purchase
- Cash out Refinance
- No Cash out Refinance
- Shopper

The methods of Qualification are listed below by Mode:

Buyer/Purchase	Cash out Refinance	No Cash out Refinance	Shopper
BuyerBaseLoan	CashoutRefiMaxCashout	NoCashRefiIncIfFee	Shopper
BuyerAvailableCash	CashoutRefiSpecifyCashout	NoCashRefiSpecifyLoan	
BuyerMaxLoan	CashoutRefiSpecifyLoanAmt	NoCashRefiSpecifyLTV	
BuyerBaseLTV	CashoutRefiSpecifyLTV	NoCashRefiNoCostRefi	
BuyerDesiredPITI			

The grids below and on the following pages outline these modes and the various methods available in each Mode with each method's input parameters.

There is a core set of input parameters that are used for all methods, and then under each method, there are one or more variations that are indicated in context.

<b>Buyer/Purchase Mode</b>	
<b>BuyerBaseLoan Qualification Method</b>	
Qualifies a borrower for a specific property (i.e. sale price is known).	
<b>GHR Term</b>	<b>Date Type</b>
ProgramID	String
PGC (Product Group Code)	String
RequestedRate	Integer 8125=8.125 %
RequestedPoints	Integer 1250=1.250 pts
RequestedCeiling	Integer 8125=8.125 %
RequestedMargin	Integer 8125=8.125 %
BaseLoan	Integer
Income	Integer
MonthlyDebt	Integer
CurrentHsgExpense	Integer
YearsExpectedinHouse	Integer
EstimatedCloseDate	String
IgnoreIncomeRatios	Boolean
OverrideRatios	Boolean
FrontRatioOverride	Boolean
BackRatioOverride	Boolean
EstimatedTaxDollars	Integer
EstimatedHazInsDollars	Integer
VAStatus	Integer
AssociationFee	Integer
FICOScore	Integer

FICORectCode1	String
FICORectCode2	String
FICORectCode3	String
State	String
County	String
Zip	String
Modbits	Integer
SalePrice	Integer

***Buyer/Purchase Mode***

**BuyerAvailableCash Qualification Method**

Qualifies a borrower based on his/her cash available for closing.

All items are the same as the BuyerBaseLoan except 'BaseLoan' is replaced by 'AvailableCash'.

<b>GHR Term</b>	<b>Date Type</b>
AvailableCash	Integer

***Buyer/Purchase Mode***

**BuyerMaxLoan Qualification Method**

Qualifies a borrower for the maximum loan amount.

All Properties are the same as the BuyerBaseLoan except BaseLoan is removed.

2025-03-10 10:40:00

<b><i>Buyer/Purchase Mode</i></b>	
<b>BuyerBaseLTV Qualification Method</b> Qualifies a borrower based on the percentage of download payment. All Properties are the same as the BuyerBaseLoan except BaseLoan is replaced by BaseLTV.	
<b>GHR Term</b>	<b>Date Type</b>
BaseLTV	Integer

<b><i>Buyer/Purchase Mode</i></b>	
<b>BuyerDesiredPITI Qualification Method</b> Qualifies a borrower based on his/her desired monthly combined principle, interest, taxes, and insurance payment. All Properties are the same as the BuyerBaseLoan except BaseLoan is replaced by DesiredPITI.	
<b>GHR Term</b>	<b>Date Type</b>
DesiredPITI	Integer

<b><i>Shopper Mode</i></b>	
<b>Shopper Qualification Method</b> Qualifies a borrower who is shopping for a house and does not have a specific property. Also known as “affordability analysis.” All Properties are the same as the BuyerBaseLoan except BaseLoan is removed but MaxLTV, MaxPITI, and AvailableCash are added as well as two percentage fields: EstimatedTaxesPercent and EstimatedHazInsPercent and a MaxPointsAsGift field.	
<b>GHR Term</b>	<b>Date Type</b>
AvailableCash	Integer
MaxPITI	Integer
MaxLTV	Integer



EstimatedTaxesPercent	Integer
EstimatedHazInsPercent	Integer
MaxPointsAsGift	Integer

<b><i>No Cash Out Refi Mode</i></b>		
<b>NoCashRefiInclFee Qualification Method</b>		
Qualifies a borrower with a loan amount that includes the original mortgage balance and closing costs.		
<b>GHR Term</b>	<b>Date Type</b>	
ProgramID	String	Defined in Buyer Mode
PGC	String	Defined in Buyer Mode
RequestedRate	Integer	Defined in Buyer Mode
RequestedPoints	Integer	Defined in Buyer Mode
RequestedCeiling	Integer	Defined in Buyer Mode
RequestedMargin	Integer	Defined in Buyer Mode
Income	Integer	Defined in Buyer Mode
MonthlyDebt	Integer	Defined in Buyer Mode
CurrentHsgExpen se	Integer	Defined in Buyer Mode
YearsExpectedin House	Integer	Defined in Buyer Mode

ate	EstimatedCloseD	String	Defined in Buyer Mode
os	IgnoreIncomeRati	Boolean	Defined in Buyer Mode
	OverrideRatios	Boolean	Defined in Buyer Mode
de	FrontRatioOverri	Boolean	Defined in Buyer Mode
e	BackRatioOverrid	Boolean	Defined in Buyer Mode
ars	EstimatedTaxDoll	Integer	Defined in Buyer Mode
Dollars	EstimatedHazIns	Integer	Defined in Buyer Mode
	VAStatus	Integer	Defined in Buyer Mode
	AssociationFee	Integer	Defined in Buyer Mode
	FICOScore	Integer	Defined in Buyer Mode
1	FICOREjectCode	String	Defined in Buyer Mode
2	FICOREjectCode	String	Defined in Buyer Mode
3	FICOREjectCode	String	Defined in Buyer Mode
ce1	CurrentMtgBalan	Integer	
ce2	CurrentMtgBalan	Integer	

CurrentMtgBalance3	Integer	
CurrentMtgRate1	Integer	
CurrentMtgRate2	Integer	
CurrentMtgRate3	Integer	
CurrentMtgPITI1	Integer	
CurrentMtgPITI2	Integer	
CurrentMtgPITI3	Integer	
CurrentMtgRemainingTerm1	Integer	
CurrentMtgRemainingTerm2	Integer	
CurrentMtgRemainingTerm3	Integer	
CurrentMtgELOC_2 <sup>nd</sup>	Boolean	
CurrentMtgELOC_3 <sup>rd</sup>	Boolean	
CurrentMtgToBePaidOff1	Boolean	
CurrentMtgToBePaidOff2	Boolean	
CurrentMtgToBePaidOff3	Boolean	
InvestmentRate	Integer	
OrigLastWithdrawal_2 <sup>nd</sup>	String	
OrigLastWithdrawal_3 <sup>rd</sup>	String	
State	String	Defined in

		Buyer Mode
County	String	Defined in Buyer Mode
Zip	String	Defined in Buyer Mode
Modbits	Integer	Defined in Buyer Mode
SalePrice	Integer	Defined in Buyer Mode

<b><i>No Cash Out Refi Mode</i></b>	
<b>NoCashRefiSpecifyLoan Qualification Method</b> Qualifies a borrower with a specified refinance loan amount. All properties from NoCashRefIncludeFee remain in addition to BaseLoan.	
<b>GHR Term</b>	<b>Date Type</b>
BaseLoan	Integer

<b><i>No Cash Out Refi Mode</i></b>	
<b>NoCashRefiSpecifyLTV Qualification Method</b> Qualifies a borrower with a specified percentage of existing loan balance. All properties from NoCashRefIncludeFee remain in addition to BaseLTV.	
<b>GHR Term</b>	<b>Date Type</b>
BaseLTV	Integer

***No Cash Out Refi Mode*****NoCashRefiNoCost Qualification Method**

Qualifies a borrower with a rate—points combination that allows the closing cost to be insulated from the borrower. In general, negative points are awarded to provide “cash-back” to the borrower, which is applied toward closing costs.

All properties from NoCashRefIncludeFee remain in addition to BaseLoan.

<b>GHR Term</b>	<b>Date Type</b>
BaseLoan	Integer

***Cash Out Refi Mode*****CashoutRefiMaxCashout Qualification Method**

Qualifies a borrower with the maximum possible cash out amount.

Properties are the same as the NoCashRefIncludeFee qualification method.

***Cash Out Refi Mode*****CashoutRefiSpecifyCashout Qualification Method**

Qualifies a borrower with an amount that will pay off the existing loan balance with a specified cash out to the borrower at closing.

Properties are the same as the NoCashRefIncludeFee qualification method plus an AvailableCash field.

<b>GHR Term</b>	<b>Date Type</b>
AvailableCash	Integer

**Cash Out Refi Mode****CashoutRefiSpecifyLoanAmount Qualification Method**

Qualifies a borrower with a specified loan amount and cash out amount.

Properties are the same as the NoCashRefIncludeFee qualification method plus AvailableCash and BaseLoan fields.

<b>GHR Term</b>	<b>Date Type</b>
AvailableCash	Integer
BaseLoan	Integer

**Cash Out Refi Mode****CashoutRefiSpecifyLTV Qualification Method**

Qualifies a borrower with a specified loan to value ratio.

Example: 70% LTV for an existing loan balance of \$70,000 will result in a loan amount of \$100,000.

Properties are the same as the NoCashRefIncludeFee qualification method plus AvailableCash and BaseLTV fields.

<b>GHR Term</b>	<b>Date Type</b>
AvailableCash	Integer
BaseLTV	Integer

**Credit Profile Inputs**

Each of the qualification methods also accept two input arrays for specifying aspects of the borrower's credit profile. These elements improve the accuracy of the Qualification Results. A Credit Report is retrieved electronically from a certified credit-reporting agency and prepared for use by the GHR interfaces. The two array elements are:

- Liabilities
- Public Records

The data elements for setting these arrays are provided below:

### **Liabilities**

5           SetNumberOfRecords(Integer);  
             BorrowerNumber  
             LateDaysLiabilityTypeMonthsFromDateReported

### **Public Records**

10           SetNumberOfRecords(Integer);  
             BorrowerNumber  
             MonthsRecordClosed  
             MonthsRecordOpened  
             RecordType  
             Amount

15

### GHR Qualification Results

- Two sets of records are returned from each qualification request. A set of products (Loan Programs) and a corresponding set of closing costs. There is a one-to-many relationship from each Loan Program to the array of Closing Cost Records. The layout of these fields is depicted below:

<i>PreQualOutput Record (Loan Programs)</i>	
GHR Term	Date Type
RejectionFlags	Integer
TotalLoanAmount	Integer
BaseLoanAmount	Integer
SalePrice	Integer
ClosingCosts	Integer
StartingPITI	Integer
APR	Integer
ReturnRate	Integer
SizeLTVPointsAdjustment	Integer
Factor	Integer
HER	Integer
TER	Integer
LTV	Integer
PI	Integer
MI	Integer
Taxes	Integer
HazIns	Integer
RequiredCash	Integer
PITIInCash	Boolean
PITIReserves	Integer
OriginationFee	Integer
UpfrontMI	Integer



MIFinanced	Boolean
TBDFee	Integer
QualRate	Integer
Arm	Boolean
Index	Integer
Margin	Integer
Cap	Integer
Ceiling	Integer
ClosingCostsUsed	Integer
Term	Integer
BreakEvenMonthNoReinvest	Integer
BreakEvenMonthReinvest	Integer
BreakEvenMonthNoReinvestWC	Integer
BreakEvenMonthReinvestWC	Integer
AIR	Integer
ARMIndex	String
Prepaid	Integer
Miapboob	Boolean
MIRenewal1	Float
CashFinanceDMI	Float
ProgramID	String
PGC	String
ReturnPoints	Integer

<i><b>Closing Cost Record</b></i>	
<b>GHR Term</b>	<b>Date Type</b>
ComputeImpounds	Boolean
Apr	Boolean
PaidOutsideClosing	Boolean
VHAAallowable	Boolean
AppliesToMods	Boolean
Financed	Boolean
Points	Boolean
InitialPremiumFinanced	Boolean
State	String
County	String
FromZip	String
ToZip	String
MortgageType	String
Description	String
Type	String
TableId	String
Name	String
PerUnitAmount	Float
Percent	Float
Fee	Float
Seller	Float
Lender	Float
Relo	Float
InitialPremium	Float
RenewalPremium	Float
Premium	Float
BuyerID	Integer

Mods	Integer
HUDNumber	Integer
ImpoundType	Integer
Unit	Integer
MonthsToEscrow	Integer
AssocHUD	Integer

### OnePipeline Implementation

In OnePipeline's architecture, the GHR components are wrapped with a CORBA interface using Borland's Delphi development tool (Object Pascal). This interface exposes a single method 'Qualify' that accepts five input parameters:

- Qualification Method
- Filter Parameters
- Qualifications (Borrower Data)
- Borrower Liability Data (From Credit Report)
- Borrower Public Record Data (From Credit Report)

With the exception of 'Mode', which is an integer value, all the other parameters are Strings. The Strings are formatted (delimited) with structures to be easily disassembled for use against the GHR COM interfaces. The format makes use of industry standards such as XML and XMLT. Data is sent to and from the CORBA interfaces utilizing IIOP over TCP/IP.

Any CORBA client can tie directly into the GHR CORBA server once the input parameters are satisfied. In our implementation, a set of JavaBeans comprise the client side of our architecture. There is a JavaBean representing each of the Qualification Methods expressed by GHR. The JavaBeans expose mutater methods for setting each element of the input parameters for Filter Parameters, Borrower Liability Data, Borrower Public Record Data, and Qualifications. The Qualification Mode is encapsulated within the JavaBean

corresponding to the GHR qualification method. All of the JavaBeans expose a Qualify() method through inheritance that performs all of the CORBA location and marshalling functions necessary to interact with the GHR CORBA Server. The result of the Qualify() method call is a delimited String representing the

5 'PreQualOutput Records' and 'Closing Cost Records' described above. Navigating the output is facilitated by a special IqualifiedProducts JavaBean which receives the formatted return String, parses the records, and exposes methods for accessing individual elements of semantic importance as also outlined in Qualification Results section above. These JavaBeans are dependent on the visibility of the GHR CORBA Server via an IIOP channel and are not well suited for integration with the outside world.

To expose the functionality of the Qualification features of the OnePipeline system to the outside world, the JavaBeans encapsulation of the GHR CORBA Server's API is further abstracted to facilitate clients via the HTTP protocol. A Java enabled HTTP server is positioned to intercept function calls via 15 the outside world and pass them into the JavaBeans which in turn make their normal CORBA requests to the GHR CORBA Server.

Referring now to **34**, with reference to the descriptions above, this OnePipeline - GHR Systems communications interface is defined in functional overview. An HTTP server receives inputs from applicants' system, wherein requests for data are processed and an instantiation of a GHR client JavaBean occurs based on type of qualification desired **3503**. These GHR JavaBeans provide an API into the GHR CORBA Server using distributed computing data marshalling over the Internet Inter-ORB Protocol (IIOP) **3505**. The IIOP request 25 is transmitted to a GHR CORBA server **3509** where the data from the client JavaBeans are accepted, unmarshalled and used to trigger the instantiation of the GHR Systems COM objects. The GHR system using its COM objects, processes the request and returns qualified loan programs (if any). These data are formatted into an XML data stream and sent back to the client JavaBean. **3511**. The OnePipeline system code receiving the XML datastream, parses the datastream 30

and creates an HTML document for return to the calling web browser for end-used interaction.

In an alternative embodiment, subprograms for performing the functions equivalent to those of the GHR system would be developed internally to applicants system.

The 'Originator Task Menu and Origination Fee Assessment' function.

As indicated above, upon completion of the loan selection and formal loan request, the loan originator is given the screen shown in Figure 28A and is asked to specify the loan origination fee and to choose the functions in steps 3, 4 and 5 which the loan originator will do. The 'Originator Task Menu and Origination Fee Assessment' function **519** in **Fig. 5** uses these selections as well as the other non-selected required tasks to construct the inputs which are passed to the Compliance Engine as described above.

The 'Loan Fulfillment Workflow Process.

The composite of information which is passed to the 'Loan Fulfillment Workflow Engine' **545** in **Fig. 5** as a new 'context' or data embodiment, and by which a new, discrete, mortgage process is created comprises the summation of data or information supplied by the 'Compliance Engine' **520**, the list of tasks related to the specific loan as described above. In a preferred embodiment, the list of tasks for the specific loan are delivered by the Compliance Engine to the Loan Fulfillment System (**462** in **Fig.4C**) which comprises a Loan Processing and Mortgage Workflow Engine such as Framework, Inc.'s Lendware™ product. In an alternate embodiment the 'Loan Fulfillment Workflow Engine' **545** in **Fig. 5** is contained within applicants' system and would be built around the Sun Microsystems™ Inc. Forte™ Conductor™ engine product to manage and control the related business processes and to provide a runtime shell to facilitate coordination of application services within the business process. The various business applications related to the steps to be processed in completing the mortgage loan closing are pre-defined to the Forte Conductor system (just as they

are in the Lendware product) so that when the 'mortgage functions' and their designated 'actionees' (if any) are passed to the 'Loan Fulfillment Workflow Engine' and to its Forte Conductor engine, these 'functions' are executed in an integrated environment where both the function process definition and each of the supporting applications is pre-defined and will execute automatically. The supporting applications are a set of application proxies, each representing the business service provided by its application and the pre-defined actions to take are contained in an XSL rule base, consisting of rule documents. Specific rule documents are assigned to proxies so they can interpret and transform messages

The 'Loan Fulfillment Workflow Engine' 545 and its Forte Conductor engine assures that processes happen in the correct sequence and in accordance with the (software controlled) pre-determined, programmatic branching conditions defined by the 'Worker Profile Attributes' 543 business process definition. The 'Loan Fulfillment Workflow Engine' 545 may call upon any combination of 'workers', heretofore described as computers, data tables, software, persons, organizations, companies, or other data sources, etc. to perform the required tasks. The 'worker' or 'agent' is typically manifested in one or more of the following ways: as an individual, an organization, one or more data tables, a data processing system, or the like.

In this alternative embodiment the pre-programmed functional steps executed by the Forte Conductor system are shown in **Figure 6**. The types of activities represented by the icons on **Figure 6** include the following;

<u>Icon</u>	<u>Description</u>
Opening door	Beginning of a new process, in this case a new loan
Closing door	Ending of a process
Computer	Automated activity that does not require human interaction
Monitor interaction	Manual or partly manual activity requiring human
Alarm Clock	Timer activity which initiates the next activity based on

passage of time

The process definition drawing shown in **Figure 6** defines the process activities for the OnePipeline.com compliance workflow system. By performing the defined activities under the strict control of the Conductor workflow engine, the engine ensures that all required tasks are completed, and in the required sequence. The engine presents activities only to workers whose role designations match the role designations of the activity. The earlier system activities assigns roles in advance to workers only after verifying that the pre-requisite qualifications are satisfied. In this fashion, loan originators are assured that all applicable pre-qualifications are satisfied and that they actually performed all the services for which they were compensated. When a loan process is initiated in the workflow system a call is made to the Forte Conductor software to instantiate a new loan workflow process for the specific loan, as indicated by the parameters passed in the calling sequence.

This workflow process is better understood with reference to **Figure 6**. Referring now to **Fig. 6**, the loan originator **601** gathers credit data, gets authorization and requests pull credit **603**. The automated system **607** pulls credit **609**, processes the credit report, parses FICO, public records and liabilities **611**, and the credit profile is saved to the Oracle™ data base **612**. If this credit clearing process exceeds 15 minutes a timeout occurs **615** and a message is sent to the user indicating a failure in the credit processing. When the credit profile is completed and saved to the Oracle™ data base **612** and the loan originator **601** has completed the loan wizard and Express app via the website **604** the system then begins the underwriting assessment **617**. If the FICO previously determined in step **611** is not less than **620** the process driver submits the request to automated underwriting **621**. If it is approved **623** the system generates task lists and compliance documents (GFE, TIL, Disclosures, etc.) **625** and submits them, to the loan originator **627**, to the premium broker processor **649**, to the premium broker account executive **651**, for their individual completion of their respective tasks to complete the loan process. The loan originator **627**, the premium broker processor **649**, and the premium broker account executive **651**, all electronically

submit a task completion message to the system 631 and it compares the submissions against authorization criteria 633. If the criteria are met the system determines whether the user has requested that the loan rate be locked 635 and if so the loan is locked-in with the investor 661 and a message is passed to the clear-to-close auditor 665, 659 where a determination is made as to whether the transaction is clear-to-close 667. If so a message is passed to the closer 669 to close the loan 677. A message is then passed to the funder/shipper 671 to fund/ship the loan. The funder/shipper 671 does two things: first it verifies the investor purchase of the loan 683 and notifies the controller 675 to update the general ledger that funds have been received 689 and tells the end transaction mechanism 691; secondly the funder/shipper 671 tells the controller 675 to update the General Ledger to disburse the funds 687 which submits a requisition to payroll 685 who notifies the end transaction mechanism 691.

The system has capabilities to determine that the required criteria have not been met/completed 633 and determine whether to resubmit the loan request to automated underwriting 639, 640 or to notify the underwriter 641 to iterate on the credentials review process 643 and either deny 645, 647 the loan or approve it 645, 623 and generate the task lists again 625.

Thus the loan process in this alternate embodiment is driven through the required tasks by the Forte Conductor engine to assist in the complying with the various regulations and yet automate the process in a helpful and efficient manner. In the preferred embodiment the ASP system LendWare or its equivalent drives the loan process and the individual task workers in a manner similar to that described above. In the preferred embodiment the task completion data is passed to the Compliance Engine which monitors the list of tasks for each loan and which can also communicate directly with some task workers when certain critical events occur or timeouts are perceived.



The ‘Task List Maintenance and Status Reporting Gateway’

The ‘Task List Maintenance and Status Reporting Gateway’ 550 in Fig. 5 or 463 in Fig. 4C serves as a portal to communicate to and from other agents and workers who are qualified to perform assigned tasks. These tasks are those which would be assigned by the ‘Loan Fulfillment Workflow Engine’ 545 or by the ASP workflow processor Lendware 463 to other agents or workers to complete prior to the closing of the loan and distribution of funds. While this gateway is similar to the ‘loan origination gateway’ it is significantly different in that the middleware layer must handle the conversion of data format and protocol of the Forte Conductor engine or the Lendware workflow engine to and from the formats and protocols of the agents/workers to which the workflow process is communicating. Accordingly, The ‘Task List Maintenance and Status Reporting Gateway’ 550 in Fig. 5 is used to transmit messages from the workflow engine to these other agents and to receive responses from authenticated agents. These agents would be performing tasks such as ‘title search’, ‘survey’, ‘credit check’, etc. The ‘Task List Maintenance API and Status Reporting Gateway’ 550 can also use the same interface modes as envisioned for The ‘Loan Origination Gateway’ 505. Envisioned are at least, three (3) ways by which the system may access and be accessed by a loan agent/worker: (1) via Internet website, (2) via custom-written software which connects in a data transmission-enabled manner to the present invention, and (3) via ‘wireless’ devices including voice activated devices, as previously described for the ‘Loan Origination Gateway’ 505.

A loan originator or borrower may also come into the system via this gateway to check the status of the loan process, etc. As indicated below every entrant via this gateway must never-the-less be authenticated before entry is allowed. Conveyance of task lists to a loan originator and associated workers and reporting of borrower loan status are accomplished through a programmatic presentation 552 which embodies the following: ‘borrower status report(s)’, ‘originator’s task list’, and ‘other worker’s task lists’ (as described above)- said information exchanged through this ‘task maintenance & status reporting

Gateway' (the "TMSR gateway"). This 'TMSR gateway', functions in a manner similar to that used during the loan origination process. Reports may be conveyed by a variety of programmatically controlled means , such as web pages, PDF® files, word processing format files, etc. The TMSR gateway receives the direction messages from the 'Loan Fulfillment Workflow Engine' 553 in the standard Forte Conductor or Lendware API format , and using the middleware layer described before, converts the format and message protocol into that required to communicate with the desired agent/worker. Similarly, the TMSR gateway can receive messages from the various agents/workers in various formats and protocols (i.e. HTML, XML, WML, WAP, etc.) and converts these messages and protocols into the standard API formats used in the preferred embodiment.

Referring now to **Figure 36** the principle purpose of the 'TMSR Gateway' 4200, in serving as a portal, is to provide a way for the loan originator and borrower to check the status of the loan process and for the 'loan process workflow engine' to communicate to and from the other agents/workers who are doing some task required by the process, without having to worry about what input method or output method is required to communicate with a given entity, and/or the related data formats and protocols. Consequently the major purpose of the TMSR gateway is to perform the middleware tasks of - recognizing the input channel and data format and protocol used 4209 and convert the data to the standard workflow engine Application Programming Interface (API) format 4211 which will be used by the workflow engine. Similarly, on receiving a message to be transmitted from the workflow engine, the TMSR gateway middleware structure is required to determine the format & protocol used by the addressee and convert the message from the workflow engine API format into the format and protocol of the addressee 4215 and then transmit the message 4217 to the addressee 4203 or 4205 or 4207. The input data originates from the input screens provided by the system, and from the output data pre-defined in the various task elements in a typical loan workflow process. The workflow engine will typically transmit a required message whenever an event occurs which requires a message be sent or resent (because of a timeout for example).

The TMSR gateway is required to pass the received data to a second authentication module **549 in Fig. 5** or **464 in Fig.4C**. This authentication module once again verifies the used ID and password of the inputting user. In the preferred embodiment this check does not verify the legal qualifications of the user. In an alternative embodiment, the user ID is checked to determine the worker Type, and the roles this type worker may perform for this location of the property and for his location are verified against the role he is attempting to play. Similarly the compliance engine checks to see if the various legal regulations allow this agent/worker to perform the role they are attempting to play. If so the authentication module **4212 in Fig. 36** will pass the data submitted to the aforementioned workflow engine **4213** for its processing of the incoming data in response to the task assigned.

#### Transaction Service Provider Gateway

Returning now to **Figures 4C and 5**, the 'Vendor Management API Gateway **467 in Fig. 4C** or the 'Transaction Service Provider Gateway' **555 in Fig. 5** serves to manage 'tasks' assigned to external agents or workers or vendors with whom Applicants' have a special vendor relationship. That is, a vendor who supplies appraisals in a given locality, loan processing, credit checks, title searches, flood certification, mortgage insurance, etc. The 'Vendor management API Gateway' or the 'Loan Fulfillment Workflow Engine', (see **Fig. 6** for example) in developing a task list for the loan originator (**627 in Fig. 6**), recognizes some tasks as falling under the responsibility of the loan originator as determined in the loan origination process, and some tasks which are to be automatically forwarded to certain service provider agents or vendors. The communication of these assignments, occurs in a different manner than those described above relative to the TMSR gateway. Since these tasks tend to be more routine and repetitively performed by the specific vendors, the workflow engine will send a message to the designated vendor and wait (i.e. maintain the telephonic or electronic connection) until the vendor supplies the desired response (which normally would be within a few minutes) or until a watchdog timer

expires. If the timer expires the workflow engine will try the communications again as well as notify a system manager that the vendor has not responded.

For example referring now to **Figure 36** the 'transaction service provider gateway' (the "TSP gateway") **4400** is described. The functioning of the 'Vendor Management API gateway' under the control of Lendware, for example, would function similarly. Whenever the workflow process for this loan **4401** recognizes an event/task which requires a communication to a vendor/partner (service provider), the workflow process constructs the message and passes it to the TSP gateway **4403**. The TSP gateway determines the format and protocol required to communicate with the indicated service provider and translates the message from the workflow process format into the required format and protocol for the service provider **4405**. The TSP gateway then establishes a persistent communications link with the service provider **4407** and sends the message and waits for a response **4409**. If the service provider does not respond in a given time a watchdog timer expires **4411, 4413** in which case the system administrator is notified **4415** and the message is resent **4409**. If the service provider responds within the allotted time **4423, 4425** the circuit connection is released **4427** and the response is translated from the format and protocol of the service provider into the format required by the workflow process **4429** and the response is passed back to the workflow process **4431**.

During the course of the workflow process execution of the various tasks as shown in **Figure 6**, the workflow process engine records each transaction into an Oracle database in order to create and maintain an audit trail of tasks performed for this loan, when performed, by whom, etc. This database is used for certain reports triggered by other tasks in the workflow process as well as ad-hoc reports of tasks completed for various compliance and maintenance reasons.

#### Worker Compensation and Task Performance Report Module

The 'Worker Compensation and Task Performance Report' Module **468** in **Fig. 4C** or **557** in **Fig. 5**, provides a mechanism for producing reports to accounting to distribute funds to those agents/workers who have earned them in a particular loan transaction. These reports in a preferred embodiment are normally

triggered by the Compliance Engine but may be triggered in an alternative embodiment by the loan workflow process for that loan at certain pre-defined points in the workflow. This module also provides the capability for generating regulatory completion reports and/or Completion Certificates as required for each loan.

#### The 'Secondary Banking Process' Module

The 'Secondary Banking Engine' module **469 in Fig. 4C** or **561 in Fig. 5** serves to manage loan transactions as they are introduced to the secondary lending pool, and move them programmatically through the process of 'closing', 'funding', and 'shipping' the loan transaction. In one embodiment, **469 in Fig. 4C**, is managed by Lendware via on on-site installation or equivalently by Framework ASP. In an alternative embodiment, the secondary banking functions would be managed and processed within applicants' system. **561 in Fig. 5**. In the alternative embodiment, the 'Secondary Banking Engine' **561** would also serve as the mechanism whereby the transactions and funds distributions involving the bundling and selling of loans to the secondary banking institutions are verified and reported in the following manner: (a) 'Locked Loan reports, tracking all loans locked by borrowers, and reported on a regular schedule, (b) Commitment report, tracking all unfulfilled loan commitments, (c) Funding report, which tracks and reports initial funding status (d) Funded, but not Shipped report, (e) Shipped but not Purchased report, and (f) Purchased Loan report.

In an alternative embodiment, a special task of the secondary banking module is to manage use of the funds in the warehouse credit line. The management objective is to optimize the financial return generated by the funds in the warehouse line of credit. If too much of the warehouse line is consumed in covering mortgage loans processed, the overall return on these funds is diminished. Accordingly the management task is to move mortgage loans from the warehouse line to secondary investors as quickly as possible. This may be done by selling individual loans to secondary investors, or by pooling multiple

loans, according to various credit conditions and pooling rules for sale to other secondary investors.

### DESCRIPTION OF THE BEST MODE

Referring now to **Figures 31-32** the various types of computer hardware and computer software used in a preferred embodiment at the present time are depicted. In Figure 31 it is clear that Sun® Ultra5™ workstations **3101** and general purpose Personal computers (PC) **3103** may be used as input devices to the system. A Sun E250™ dual processor server **3105** is used as a development/test system running the Sun® Solaris® operating environment, Oracle® 8i, Forte® Conductor™ with a SynerJ™ server. A single processor Sun E250™ server **3107** is used in the Sunnyvale facility. Also in this facility are three Sun E4500™ dual processors **3117, 3119** and **3121**, an IBM NetFinity 7000™ quad processor with a Microsoft® NT™ server **3115** and a Hitachi Shared Disk array **3123**. There are also three IBM NetFinity 5000™ servers **3109, 3110** and **3111** located in the Salt Lake City facility.

In **Figure 32** it may be seen that loan originators interface to the applicants system using a standard Internet browser such as Internet Explorer™ **3201** with the initial interface in applicants' system being with Lotus® Domino™ **3203**. The system then performs the Pre-qualification and Loan application & Approval using GHR® Systems PremierWare™ **3209**. The Sun Solaris® operating environment in the system server (at **3203** in **Fig. 32**) interfaces with the GHR system **3209** and to FastDirect™ **3211** via IIOP through a CORBA to COM bridge and a Delphi Automation interface to Windows NT™. Solaris™ interfaces in this configuration to the Oracle 8i® server via Forte® Conductor™ **3207** through Forte Enterprise JavaBeans, Forte Distributed JavaBeans and IIOP.

Having described the invention in terms of a preferred embodiment, it will be recognized by those skilled in the art that various types of general purpose computer hardware may be substituted for the configuration described above to achieve an equivalent result. Similarly, it will be appreciated that arithmetic logic circuits are configured to perform each required means in the claims for

performing the various features of the rules engine and flow management. It will be apparent to those skilled in the art that modifications and variations of the preferred embodiment are possible, such as different computer systems may be used, different communications media such as wireless communications, as well as different types of software may be used to perform equivalent functions, all of which fall within the true spirit and scope of the invention as measured by the following claims.